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A

TRUE and PARTICULAR  
HISTORY  
OF  
EARTHQUAKES.

CONTAINING

A Relation of that dreadful EARTHQUAKE which happen'd at *Lima* and *Callao*, in *Peru*, *October* 28, 1746; publish'd at *Lima* by Command of the Vice-Roy, and now translated from the Original *Spanish*; also of that which happen'd in *Jamaica* in 1692, and of others in different Parts of the World.

Accurately describing

The dreadful Devastations that have been made by those horrible Convulsions of the Earth; whereby Mountains have been thrown down, or remov'd to great Distances; Cities, with all their Inhabitants, swallow'd up in a Moment; whole Flocks and Herds, with their Keepers, ingulph'd in the tremendous Chasms and Openings of Valleys; and large Forests sunk, and for ever buried in an Instant.

Extracted from

Authors of the most unexceptionable Credit and Reputation.

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By *PHILOTHEUS*.

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LONDON:

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THE HISTORY OF  
EARLY THOUGHTS

OF THE  
HUMAN MIND  
FROM THE  
EARLIEST  
PERIODS  
TO THE  
PRESENT  
TIME



BY  
J. H. M.  
OF THE  
BRITISH MUSEUM

LONDON

PRINTED BY  
J. H. M.



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# P R E F A C E.

**W**HEN the Almighty, to punish the Wickedness of Men, is pleased to send forth his Judgments in the Earth, he gives Commission to some one or other of his Creatures to execute his Purpose. At his Command, the Wind shall agitate the Sea so violently as to bury whole Navies in its Deep; or on Land shall work up a Storm that shall destroy the Fruits, throw down the tallest Trees, or level the noblest Buildings with the Ground. If he pleases, the Air, which conveys Life and Breath to Man, shall be the Vehicle of Diseases, Pestilence and Death. By his Permission, the Clouds shall pour down such an Abundance of Water, that a whole Country, with all its Inhabitants, whether of the Brute or Human Kind, together with the Increase of the Earth, shall be swept away with a Flood. If he wills that Fire shall be the Minister of his Wrath, what dreadful Conflagrations are kindled up in an Instant, and what terrible Ruin follows every Step it proceeds! Even the most simple Creatures, to our Apprehension, have been

made

*made the Instruments of his Vengeance, to punish a People that have obstinately persisted in their Rebellion against Him. Flies, Lice, Frogs, Locusts, &c. have taught a proud Tyrant Humility; and Pharaoh is recorded as an Example to all succeeding Ages, of the Facility with which Omnipotence can punish proud Offenders, and of the Baseness and Corruption of the Heart of Man, who would impute to any Cause, rather than his own incorrigible Disobedience, those peculiar Judgments which are manifestly the Finger of God, to correct him for, or reclaim him from, his Wickedness.*

*But of all the Judgments with which the Supreme Governor of the World has thought fit to afflict the Sons of Men, surely none are so astonishing, so amazingly terrible as EARTHQUAKES; which give little or no Warning of their Approach, nor scarce a Moment's Time for the wretched Inhabitants to lift up their Eyes to Heaven, and recommend themselves to God, but are, in an Instant, either swallow'd up alive in the Openings of the Earth, or buried under the Ruins of their own Houses. But I shall refer the Reader, for a farther Description of such dreadful Scenes, to the ensuing Sheets, where his Curiosity will be amply gratified, and his very Soul affrighted with the most horrible Desolations that it is possible for the Imagination to conceive, and beyond the Power of Eloquence to describe.*

*But*

## P R E F A C E.

But why (have some objected) should we imagine, that Earthquakes are the immediate Judgments of God, sent by Him on Purpose for the Destruction of a City, or District, or particular Part of a Country, since it's universally known they are produced by natural Causes? To this I answer, that the Almighty, in the Government of the World, and in the Operations of his Providence, does, indeed, work by secondary Causes. Thus Rain, Hail, Snow, Frost, Light and Heat, are produced according to those Laws which He first impos'd on Matter; neither can any of them exceed the Limits which He has prescrib'd to their several Spheres of Action, without his Permission; and as every Creature was made for the Service or Pleasure of Man, we may be assured, none of them shall hurt him, without a special Commission from the Sovereign Disposer of our Lives and Destinies: So that whenever we see any of the Creatures up in Arms against us, we ought to conclude, that they are the Messengers of Divine Justice, sent to vindicate the disregarded Honour of God, and to assert his Dominion in the Earth; to punish enormous Offenders for the notorious Breaches of his Laws, and to convince Mankind of their Weakness and Imbecility to cope with the meanest of his Creatures, whenever He empowers them to call their lordly Masters to an Account.

It is, indeed, allow'd, that Earthquakes are produced by natural Causes; but what those Causes are, which produce such tremendous Effects,

*fects, have been the Subject of much Debate among the Learned. I shall, for the Satisfaction of the inquisitive Reader, recite some of their Opinions, which seem to carry the most Probability with them.*

*M. Frezier, late Engineer to Lewis XIVth of France, by whose Orders he visited and examined the Kingdoms of Peru and Chili, accounts for these surprizing Phænomena, which are frequent in those Countries, upon this Hypothesis, viz. That the two main Principles of these dreadful Mischiefs, are Heat and Moisture.*

*There is no reflecting upon such extraordinary Phænomena, says he, without being led by natural Curiosity to enquire into the Cause of them. That which Philosophers generally assign for Earthquakes, does not always appear satisfactory. They are ascribed to subterraneous Winds and Fires; but it is likely they ought rather to be look'd upon as an Effect of the Waters, which, upon digging, the Earth appears, every where, to be inwardly moisten'd with, as living Bodies are by the Veins.*

*Now, the Waters may occasion Earthquakes after several Manners; either by dissolving the Salts scatter'd thro' the Earth, or by penetrating thro' porous Lands, mix'd with Stones, which they insensibly loosen; and the Fall or Removal thereof, must cause a Stroke or Shock, such as is felt in Earthquakes. Lastly, the Water penetrating some sulphurous Bodies, must there cause a Fermentation; and then the Heat produces*  
*Winds*



## P R E F A C E.

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*Winds and foul Exhalations, which infect the Air when they open the Earth; whence it is, that after great Earthquakes, Abundance of People die.*

*The Facility of this Fermentation is proved by the Example of Lima, and by a curious Experiment of M. Lemery, particularized in the Memoirs of the Academy of Sciences, for the Year 1700. If, after having temper'd equal Parts of Filings of Iron, and of Sulphur, to a certain Quantity, as of thirty or forty Pounds, with Water; that Amalgama, or Paste, be buried in the Ground a Foot deep, it will open and cast forth hot Vapours, and then Flames.*

*Now in Peru and Chili, the Earth is all full of Mines of Salt, of Sulphur, and of Metals; add to this, that there are burning Mountains, which calcine the Stones, and dilate the Sulphur: Earthquakes must therefore be very frequent in those Parts, and particularly, along the Sea-Coasts, which are more water'd than towards the Top of the Ridge of Mountains, call'd La Cordillera. This is, besides, quite agreeable to Experience; for there are some Places where those Concussions of Nature are very rare, as at Kusko, Guamanga, and elsewhere, for the same Reason that they are more frequent in Italy, towards the Alps. In fine, it cannot but be acknowledg'd, that the Water has great Share in Earthquakes, when we see Fields run like melted Wax; and Lakes form'd, on a sudden, in Places which sink; because the Ground subsiding*

*forces*



*forces the Water to rise above it ; or else to glide like Sand, when the Base is dissolved, or on an inclining Plane.*

*Although Frezier has asserted the Cause of Earthquakes to be Water, he is oblig'd to ascribe it to Fire at last. For, in his last Instance, they are not the immediate Effect of Water, as in the two former Cases, but of Heat arising from the Fermentation produced by Water. His Receipt from Lemery is a farther Proof of this ; and all his Reasoning afterwards is but a farther Proof of this.*

*If Frezier had but reflected, how small a Quantity of Water was necessary to make the Amalgama, he would scarce have ascribed the Cause of Earthquakes to Water : For being of the Consistence of Paste, and not reducea to a Fluid, the Quantity of Water must be very trivial in respect to the other Ingredients, agreeable to a Receipt of the same Nature communicated to Dr. Wallis, and inserted hereafter ; whereby it appears, that too much Water is the only Means or Instrument of kindling the Materials ; and consequently must be so far from the Cause of Earthquakes, that too much of that Element will hinder the Explosion by which such Effects are produced.*

*I am likewise of Opinion, (says the Author of the Relation of the Earthquakes at Lima and Callao, whose Observations I here use) that Volcanos, or fiery Irruptions, must help to prevent Earthquakes ; as they serve to discharge  
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*the combustible Matters, and ventilate the sulphurous Vapours, which occasion them : So that were there a few Openings of that Kind in certain Parts of Peru and Chili, (upon a Supposition that there is a Communication among the subterraneous Cavities) in all Likelihood these Countries would not be so frequently, if at all, plagued with such dreadful Calamities.*

*As to Fields being seen to run like Wax, and Lakes formed on a sudden in Places which sink : It does not necessarily follow from thence, that the Waters have a great Share in Earthquakes, since those Effects might have been produced by Waters lodged in the Earth, at a Distance from the Place where the Explosion was made, to which the Openings of the Ground gave a Passage.*

*However that be, the Hypothesis which ascribes the Cause of Earthquakes to Wind and Fire, seems much more probable than that which imputes it to the Waters dissolving the subterraneous Salts, or loosening the Stones ; in which Cases we should not hear of those dreadful Noises and sulphurous Vapours which always precede Earthquakes ; and shew that they are the Effects of some natural Explosion, not of a bare falling or subsiding of the Earth. Besides, the Earth does not always subside, but is often lifted up perpendicularly, or horizontally agitated in such a Manner as indicates an Impulse from beneath. Let us therefore bear the Sentiments of*

*Some of our English Philosophers, on this important Subject.*

*Dr. Lister ascribes Earthquakes to the Pyrites, or Iron-Stone, lodged in the Cavities of the Earth, whose sulphurous Vapours taking Fire, catch one another, as in a Train, and produce those terrible Noises and Convulsions with which Earthquakes are attended.*

*That the Earth is more or less hollow, is made probable by the natural Cavities or Chambers which are found every where in the Mountains by digging, and which the Miners of the North call Self-opens. These they meet with frequently, some vastly great, running away with small Sinus's. Many are known to be open to the Day, as Pool's-Hole, Okey-Hole, &c. Beside, the great and small Streams which arise from under the Mountains, do evince the Hollowness of them. Add to these, that many Cavities are made, and continued by the Explosion and Rending of the first Matter fired; which may, and do, very probably, close again when the Force of that Explosion is over, but are sufficiently open to propagate the Earthquake.*

*The Damps in our Mines sufficiently witness, that these subterraneous Cavities are, at certain Times and Seasons, full of inflammable Vapours, which being fired, do every Thing as in Earthquakes, save in a lesser Degree. Now, that the Pyrites alone, of all the known Minerals, yields this inflammable Vapour, the Doctor thinks to be*

be highly probable, for these Reasons. First, Because no Mineral or Ore whatever is sulphurous, but as it is wholly, or in part, a Pyrites. The Author had carefully made the Experiment on very many Fossils of England, and found them all to contain Iron, wherever there was Brimstone.

Secondly, Because there is but one Species of Brimstone, which he knows of, at least, in England; and that since the Pyrites naturally and only yields Sulphur, it is to be presum'd, that Brimstone, wherever found, tho' in the Earth, or under Ground in Vapour, also proceeds from it. As for the Sulphur-vive, or natural Brimstone, which is found in great Quantities in and about burning Mountains, it is certainly, according to the Doctor, the Effects of Sublimation, caused, in Length of Time, by the Violence of those Fires.

Altho' the Pyrites yields such Store of Brimstone, and naturally resolves itself into Brimstone by a kind of Vegetation, yet does it not follow, that its Substance, when once fired, must be quickly consumed, and its Stores exhausted. Now, to prove the durable burning of Pyrites, the Doctor produces Instances from divers Sorts of Coal. Scotch Coal, saith he, has less of the Pyrites in it, being mostly made of Coal-Bitumen, and therefore it burns swiftly, leaving a white Cinder. The Sea-Coal, or that which comes from Newcastle by Sea, consumes slowly;



*and Sunderland Sea-Coal so leisurely, that it is said, proverbially, to make three Fires. This bath much Pyrites mixt with it, and burns to a heavy reddish Cinder, which is Iron by the Magnet, for it attracts the Cinder in the same Manner it does Iron. But the Doctor had a Sample of Coal from Ireland, which was said to be so lasting, that it would continue twenty-four Hours red-hot, without losing scarce any Thing of its Figure. This, by its Weight and Colour, seem'd to be, in a great Measure, Pyrites.*

*In England the Pyrites is neither so plentiful, nor contains so much Sulphur as that in other Countries, for though there is some little in all Places, yet they are mostly scatter'd; and if, by Chance, in Beds, these are comparatively thin, so what they are in burning Mountains: This may be one Reason why England is so little troubled with Earthquakes, and all the Parts almost round the Mediterranean Sea, particularly Italy, so much. There also the Earthquakes are frequent, long, and terrible, with many Paroxysms in one Day, and that for many Days: Here very short, but for a few Minutes, and scarce perceptible. Add to this, that the subterraneous Cavities in England are few and small, compar'd to the vast Vaults in those Parts of the World; which is evident from the sudden Disappearance of whole Mountains and Islands.*

*It may be objected, that no Body is kindled by itself: But it seem'd to Dr. Lister apparently*



rently otherwise ; for that *Vegetables* will heat and take Fire of themselves, is seen in the frequent Instance of Hay. *Animals* are naturally on Fire ; and *Man* demonstrates this when in a Fever. Among *Minerals*, the *Pyrites*, both in Gross and in Vapour, is actually, of its own Accord, fired ; of which Dr. Power, in his *Micrographia*, produces a famous Instance, and the like not very rarely happens. In short, that *Damps* naturally fire of themselves, we have the general Testimony of *Miners*, as well as Declaration of the same Author.

Nay, the *Volcanos*, all the World over, argue as much ; for there is strong Probability to believe, that they are Mountains made up, in great Part, of *Pyrites*, by the Quantities of Sulphur thence sublimed, and the Application of the Loadstone to the ejected Cinder. Now, that these *Volcanos* were naturally kindled of themselves, at or near the Creation, the Doctor holds probable, because there is but a certain Number of them, which have all continued burning beyond the Memories of any History. If therefore these *Volcanos* did not kindle of themselves, he asks, What Cause can be imagin'd to have done it ? If the Sun, he answers, *Hecla*, placed in so extreme cold a Climate (as Iceland) was kindled, for ought he can see from History, as soon as *Ætna* or *Fuogo*, which is a Mountain in the Island *Fuogo*, or *St. John's*, one of the *Cape Verd Islands* : Not the Accidents happen-

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ing

ing from Men; because they seem to have been fired before the World could be all over peopled; and being mostly on the Tops of very high Mountains, were unfit for Habitation. If said to be effected by Lightning and Thunder, or Earthquakes, that is begging the Question; for the Cause of the one is the Cause of the other.

Thus far Dr. Lister; let us next see what Dr. Wallis says upon the same Occasion. Thunder and Lightning, says he, are so very like the Effects of Gunpowder, that we may reasonably judge them to proceed from like Causes. Now the principal Ingredients in Gun-powder are Nitre and Sulphur; the Admission of Charcoal being chiefly to keep the Parts separate, for the better kindling of it. So that if we suppose in the Air, a convenient Mixture of nitrous and sulphurous Vapours, and those, by Accident, to take Fire, the same kind of Exploſion may well follow, with such Noise and Light, as in the firing of Gun-powder. And being once kindled, will run from Place to Place, as the Vapour leads it, just as in a Train of Gun-powder, and with like Effects.

The Doctor has commonly observ'd, that the Noise is perceiv'd seven or eight Seconds (or half a Quarter of a Minute) later than the Flash; but sometimes much sooner, as in a Second, or two, nay, quicker, and almost immediately upon the Lightning: At these Junctures the Lightning must be very near, or even amongst us;  
and

and in such Cases, Dr. Wallis had, more than once, foretold Mischief, which happen'd accordingly.

Now, that there is in Lightning a sulphurous Vapour, is manifest from the sulphurous Smell which attends, and a sultry Heat in the Air, which is commonly a Forerunner of more Lightning. That there is likewise a nitrous Vapour with the sulphurous, may be reasonably judged, because we do not know of any Body so liable to a sudden and violent Explosion.

As to the kindling of these Materials, in order to such Explosion, the Doctor was told, that a Mixture of Sulphur and Filings of Steel, with the Admission of a little Water, would not only cause a great Effervescence, but of itself break forth into actual Fire. He says, a little Water, because too much will hinder the Operation, or quench the Fire; which he takes to be the Case of Bath Waters, and other hot Springs, where Steel and Sulphur cause a great Effervescence, but no Flame. So that there needs only some Chalybeat, or vitriolic Vapour (or somewhat equivalent) to produce the whole Effect, there being no Want of aqueous Matter in the Clouds; and there is no Doubt but, amongst the various Effluvia from the Earth, there may be copious Supplies of Ingredients for such Mixtions.

After the same Manner we may account for the kindling of *Ætna*, and other burning Mountains, where the Mixture of Steel and Sulphur  
may

*may produce a Flame, which is often attended with prodigious Explofions, and Earthquakes, from great Quantities of Nitre, as in springing a Mine.*

*The Doctor proceeds to shew, that Nitre, which is the Cause of those Explofions, is also the chief Agent in the Generation of Hail; and that as Hail is very often an Attendant of Thunder and Lightning, so it might be scatter'd by those Explofions, like Small-shot out of a Gun, and cause those Holes which are said to be found in the Cloaths and Flesh of Persons, who have been killed or hurt by Lightning; of which many Instances might be produced. See Philos. Trans. 236. p. 5. Lowth's Abridgm. Vol. II. P. 177.*

*Thus have we given a succinet Account of what the Learned have alledg'd to be the Cause of Earthquakes; which we judg'd necessary for the Instruction of our Readers in their Perusal of the following Sheets.*





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A  
DESCRIPTION  
OF THE  
TOWN *and* PORT  
OF  
CALLAO.

**P**REVIOUS to the Account which we are about to give of the dreadful *Earthquake* which happen'd at *Callao* and *Lima* in the Year 1746, it may be necessary to give some short Description of those Places, as they were before that Calamity befel them. And first, of *Callao*.

This Town was built on a low flat Point of Land, at the Edge of the Sea; so that the Level is not more than nine or ten Feet above High-Water Mark, which does not rise and fall over four or five. However, it sometimes exceeds to such a Degree, that it floods the Out-skirts of the Town, as happen'd in *September* 1713; from whence, says *Frezier*, it is to be fear'd, it may, some Time or other,

C destroy



destroy the same ; which Prediction hath lately been too fatally verified.

As to the Astronomical Situation of this Place, *Frezier* puts it in 12 Degrees, 7 Minutes of South Latitude : Hence, as it stands about two Leagues South-west of *Lima*, we may compute its Longitude or Meridian Distance from *Paris*, to be about 79 Degrees, 24 Minutes West, and from *London* 76 Degrees, 59 Minutes.

*Callao* was much longer than broad. The Streets were all in a Line, but did not, for the general, intersect each other at right Angles, nor divide the Town into the usual Dimensions or common Squares observed in other Places. They were likewise so intolerably dusty, that there was no walking in them with any Satisfaction. The Houses were, for the most part, of but one Story. By the Sea-side stood the Governor's House, and Palace of the Vice-Roy ; which two Buildings took up two Sides of a Square ; the Parish-Church making the third, and a Battery of three Pieces of Cannon the fourth. In the same Street, on the North-side, were the Ware-houses for Commodities which the *Spanish* Ships brought from *Chili*, *Peru* and *Mexico* ; also another for laying up *European* Commodities, which they call *La Administracion*.

Besides these few publick Structures, there were none of any Note, except the Churches, which

which were built only with Cane, interwoven and cover'd with Clay or Timber painted white. There were also five Monasteries, belonging to the *Dominicans*, *Franciscans*, *Augustins*, *Mercenarians*, and *Jesuits*; besides the Hospital of *St. John of God*.

*Frezier* tells us, that the Number of Inhabitants in 1714, did not exceed 400 Families, though they reckon'd 600, according to *Fuillée*; which, at Eight to a Family, falls but 200 short of the Number assign'd by the Narrative at the Time of the *Earthquake* in 1746. *Fuillée* says, they were almost all Seamen, and, for the most Part, without either Politeness or Civility.

Without the Walls of *Callao* were two *Indian* Suburbs, both call'd *Pitipiti*, but distinguish'd by the Names of the *Old* and *New*; the first on the South, the other on the North Side; through which runs the River of *Rimak*, or of *Lima*.

The Town would be agreeable enough, if the Heats, which continually rage there, were but temper'd now and then with Rain, which never falls along this Coast. To the Eastward of this Place is nothing to be seen but large Plains adorn'd with handsome Country Houses; to which belong fine Orchards water'd by Canals cut from the River. In these Orchards one meets with several Kinds of Fruit-trees, the most numerous of which are  
C 2 those

those which bear Olives, much larger than the *European*. Besides these, and Orange and Citron Trees, there are none but what are peculiar to the Country, as *Fuillée* observes.

*Callao* was fortified in the Reign of King *Philip IV.* with an Enclosure flank'd with ten Bastions on the Land-side; and by some redant and plain Bastions on the Edge of the Sea, where there were four Batteries of Cannon to command the Port and Road.

The Rampart was of two different Breadths; the Curtains at Top but eight Feet thick, two and a half of Earth, as much Banquette, and three of Stone set in Mortar. The Rampart of the Bastions had five Fathoms of Earth, laid with unequal Planks, to serve as a Platform for Cannon; the Whole unsolid, because ill built. The Bastions were vaulted, and had their Magazines of Powder, Ball, and other military Stores for the Service of the Artillery, which consisted of two, three, or four Pieces of Cannon; when *Frezier* was there, the whole Number amounted to forty-one, but of several Sizes, from 12 to 24 Pounders, *Spanish* Weight.

The Land-Forces of *Callao* consisted of seven Companies of *Spanish* Foot, of 100 Men each. The Garrison was composed of 600 Foot. But altho' the King of *Spain* had settled a Fund of 292, 171 Pieces of Eight a Year, for maintaining of this Garrison, yet  
when

when *Frezier* was there, there were scarce Soldiers enough to mount the Guard at the Place of Arms.

I shall not lengthen this Account by enumerating the several Officers, Civil and Military, in this Port, together with their several Salaries and Appointments; nor describe the Trade carried on with the Inhabitants of *Chili* and *Mexico*, and all Parts of *Peru*, and likewise with *Europe*; let it suffice to say, that it was very considerable.

*Callao* Port is about eight Leagues South-Eastward of *Chancay*, and 21 North North-west of *Caniate*, two other Ports mention'd in the following Narrative of the *Earthquake*. It lies in a kind of Bay formed by the Island of *St. Laurence* and the Rocks *de los Pescadores*, five Leagues distant to the North North-west, but about two from the Continent, and three South of *Chancay*. The Island of *St. Laurence* shelters this Port from the South and West Wind, which last is the most dangerous one that blows here, and breaks the Surges that come from the South-West.

*Frezier* observes, that the Road of *Callao*, which lies to the West of the Town, is the largest, finest, and safest in all the *South-Sea*. There is Anchorage every where, in as much Depth of Water as every one likes, on an Olive-colour'd Owze, without Danger of Rocks or Shoals; excepting one, which is  
three



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three Cables Length from the Shore, about the Middle of the Island of *St. Laurence*, opposite to *Gallera*, a Place where private People send their Slaves when they offend them. This Island, *Duret* says, was formerly inhabited by People whose Lord was much fear'd and respected by his Subjects: He was so jealous, that all his Domesticks, as well as those who guarded his Women, were Eunuchs; nay, these latter had their Noses cut off, that his Concubines might not take a Liking to them.

The Sea is there always so still, that Ships careen at all Seasons, without fearing to be surpriz'd by any sudden Gusts: However, it is open from the North to the North-west; but those Winds hardly ever blow above a small easy Gale, which does not cause the Sea to swell to any Danger.

The Point of *Callao*, before-mention'd, is a low Slip of Land, a little to the South or South-west of the Town; and between it and the Isle of *St. Laurence* is a narrow Gut or Passage, call'd the *Boqueron*, or *Mouth*, which lies North-west and South-east.

In the Port of *Callao* are found all Conveniences and Necessaries for Navigation. The Watering is easy at the little River of *Lima*, which falls under the Walls of *Callao*. Wooding, however, costs more Trouble, being half a League to the Northward, at *Bocanegra*.  
They



They cut the Wood half a League up the Country, and pay the *Jesuits* 25 or 30 Pieces of Eight for each Boat-full. For the Convenience of landing out of the Boats, there are, close by the Walls, three Wooden Stairs and a Stone-Mole; design'd for the unlading of Cannon, Anchors, and other Things of Weight, which are hoisted up by a Sort of Crane.

This Part of *Callao* is never without much Shipping. Besides, the King of *Spain* always keeps three Vessels there, and two or three Galliot.

The *Spaniards* at *Lima* have Servants in the Country, who are employ'd to trade with the *Indians* for Gold; and here the Plate-Fleet, which carries the Treasure both of the King and Merchants, has its Rendezvous before it sails for *Panama*, as it always does, when the *Spanish Armada* comes to *Porto-Bello*. This *Armada* arrives at *Cartagena*, whence an Express is immediately sent over Land to *Lima*, thro' the Southern Continent, to give Notice of its Arrival, and hasten the King's Treasure; upon which the Vice-Roy immediately sends it away to *Panama*, where it is landed, and lies ready to be sent by Land to *Porto-Bello*, on the first News of the *Armada's* Arrival there, in order to be carried to *Europe*.

It requires some Time for the *Lima* Fleet to unlaid, because the Ships ride not at *Panama*,

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*ma*, but at *Perica*, an Isle two Leagues off. The King's Treasure is said to amount commonly to 24 Millions of Pieces of Eight, besides Abundance of Merchants Money and Goods; all which is carried on Mules.

From this Port is sent, every Year, a Vessel to *Acapulco*, with Quick-silver, Cacao and Pieces of Eight. She arrives commonly a little before *Christmas*, and stays till the coming of the *Manila* Ship; when she takes in Spices, Silks, Callicoes, Muslins, and other *East-India* Commodities for the Use of *Peru*, and then returns to *Callao*. She carries only 20 Guns; but her Lading is extremely rich, both outward and homeward-bound.

When Sir *Francis Drake* arrived here the 15th of *February*, 1578, he found 30 Ships in the Port. But although 17 of them were the best in the *South-Sea*, and all ready provided, yet that Hero had the Courage, with only one Ship and a Pinnace, to enter into the Midst of them, and anchor all Night. Here, if he had been revengeful, he had an Opportunity of gratifying his Passion to the full; and might have done the *Spaniards* more Mischief in a few Hours than they could have recover'd in many Years. However, if he spared them one Way, by not making Reprials in Blood for their Cruelty to the *English*, he took Satisfaction, at least, in some Measure, another Way: For understanding that  
there

there was a Ship among them belonging to one *Michael Angelo*, wherein were 15,000 Bars of Silver, and a Chest full of Rials of Plate, besides Silk and Linen, he singled her out, and made her Prize.

This Ship was a sufficient Recompence for all their Labours: But it was nothing in Comparison to the Reward which Fortune had in Store for them: For here he got Intelligence of the Ship *Cacafogo*, the Glory of the *South-Sea*, laden with Gold and Silver from *Chili* and *Peru*, which had failed for *Panama*, where that Treasure is landed, in order to be carried, by Way of *Cartegena*, to *Europe*. And altho' she had set out fourteen Days before, yet the 16th, early, he put to Sea, in Hopes of overtaking her. In the Way he snapped up a Vessel from *Gudiaquil*, laden with 80 Pound Weight of Gold; and and on the First of *March*, at Cape *Francisco*, one Degree to the North of the Line, came up with this wealthy Prize. They found in her a large Quantity of Jewels and precious Stones, 13 Chests of Ryals of Plate, 80 Pound Weight of Gold, 26 Tun of unrefined Silver, two very large Silver drinking Bowls, and other Riches.

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*A Description of LIMA, the Capital of PERU.*

**L**IMA is two Leagues distant from *Cal-lao*; from which Port the Road begins on the North Side from the new Suburb, is good and pleasant, along a fine Champain. Mid-way is a Chapel of St. *John of God*, called *La Legua*, or *the League*; and three Quarters of a Mile beyond, the Road parts into two Branches; that on the left Hand leads to the Royal Gate of *Lima*; the other to that called *Juan Simon*, which answers to the Middle of the City.

This Plain is full of very neat Country Houses, with Fruit both indiginous and foreign. It is mostly taken up with Alfarfars, that is, Fields where they sow a Grain which produces a Plant call'd *La Sern* or *Medica* (because the Seed came first from *Media*.) It bears liguminous Flowers, whose Stalk is about two Feet long, and divided towards the Top into several Branches, loaded with little blue Flowers, which, when blown, give those Plains a most beautiful Aspect. As soon as these Plants, call'd also Alfarfars, are cut, others shoot forth. Every Morning one sees vast Numbers of Asses loaded with them, enter



ter *Lima*, with each a Bone in his Mouth, to prevent their eating them.

To the South of *Lima* is the Valley of *Pachakamok* (the Name of the unknown God whom the *Indians* ador'd in their Hearts) where are still seen the Remains of the superb Temple built in Honour of that Divinity. Historians report, that *Ferdinand Pizarro* found there, over and above the Pillage made by the Soldiers, 900,000 Ducats, which the *Indians* had not Time to hide with the Gold and Silver which they carried off on the Approach of the *Spaniards*.

As to the Situation of *Lima*, Astronomers have fix'd it but with a small Variation from that of *Callao*; yet even in this they differ so much, that *Fuillée* advises Astronomers to chuse some other Place than *Lima* to make their Observations; for that the Sun seems not to be made for the Inhabitants, to whom it is visible scarce three Months in the Year.

This City, according to *Frezier*, is built at the Bottom of a Vale, formerly call'd *Rimak*, from a noted Idol of the *Indians*, which was famous for Oracles, whence, by Corruption, and thro' the Difficulty those People found in pronouncing the Letter R, as harshly as the *Spaniards*, came the Name of *Lima*; which is quite different from that given it by its first Founder, *Francis Pizarro*, who calls it *La Ciudad de los Reges*, or *the City of the Kings*; meaning the three wise Men who came out

of the East to worship Christ new-born ; perhaps because the *Spaniards* conquer'd that Vale on the Day of the *Epiphany*, as many pretend. *Fuillée* says that Name was given to it on its having been founded on the Day of *Epiphany*, in the Year 1534 ; but *Frezier* affirms, that this happen'd on the 18th of *January* 1535, the Festival of *St. Peter's Chair*.

This Epocha is also determin'd by the Reasons *Pizarro* had for building a City in the Place where *Lima* now stands : For *Herrara* tells us, that the Lord Lieutenant, *Don Pedro de Alvarado*, advancing with an Army from *Guatemala* to *Peru*, with a Design to make himself Master thereof ; *Pizarro* came to make a Settlement in the Vale of *Lima*, near the Port of *Callao*, which is the best on the Coast, to obstruct his arriving by Sea, whilst *Don Diego de Almagro* march'd by Land to oppose him in the Province of *Quito*.

The *Spaniards*, before they erected any Structure, laid the Foundations of the Church, much about the Midst of the City. *Pizarro* laid down the Streets, and distributed the Spaces for the Houses, by Quarters, of 150 Varas, or *Spanish Yards*, that is, 64 Fathoms square. Afterwards, twelve *Spaniards*, who were Citizens, began to build for themselves after his Direction. These were join'd by thirty more from *San Gallan*, and some others who liv'd at *Xanxa*, amounting in all to 70 Inhabitants ; from which inconsiderable Beginning

ginning it increased to be the largest City in all *South-America*.

The Distribution of the Plan is very beautiful. The Streets are in a direct Line, and of a convenient Breadth. In the Midst of the City (but near the River) were to be found together all Things for the publick Service. The East Side was taken up by the Cathedral, and the Archbishop's Palace; the West by the Council-House, the Court of Justice, the Prison, and the Guard-Chamber, with a Row of uniform Porticos and Shops.

In the Midst of the Square was a Brass Fountain, adorn'd with the Statue of *Fame*, and eight Lions of the same Metal, contriv'd to spout all about. At the Angles were four other little Basons, very rich in Metal.

One Quarter from the Royal Square, on the North Side, runs the River of *Lima*, which is almost always fordable, except in Summer, when the Rains fall on the Mountains, and the Snows thaw. There are Trenches drawn from it in several Places, to water the Fields, as well as the Streets and Gardens within the City, whither it is convey'd in cover'd Passages.

A little to the North of the Vice-Roy's Palace this River is cover'd with a Stone Bridge of five Arches, which communicates with a great Suburb, call'd by the *Indians*, *Melambo*, and by the *Spaniards*, *Lazaro*. Large Canals that pass thro' the Suburb, turn several Corn  
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and Powder Mills, and water several Gardens, whose Fruit is excellent, especially the Figs and Grapes. The principal Street is near a League in Length, and leads directly to the Church of the Suburb, and terminates near the *Alamedo*; which is a Walk of five Rows of Orange Trees, about 200 Fathom long; the broadest of the Walks between them being adorn'd with three Stone Basons for Fountains. The Beauty of those Trees always green, the sweet Odour of the Flowers lasting almost the whole Year, and the Concourse of Calashes daily resorting thither about Five in the Evening, the Time of taking the Air, make this Walk a delightful Place.

About the Middle of it is a Chapel, call'd the *Invocation of St. Liberata*, built in the Year 1711, in a Place where the holy *Ciborium* of the Cathedral, which had been stolen and buried under a Tree, was found. This *Ciborium* is the Pix, Box, or Cup, wherein the Host, or consecrated Wafers are kept in Popish Churches. That little Walk terminates at the Foot of the Mountain, wherein was a Monastery of the *Observants*, reform'd by St. *Francis Solano*, a Native of *Paraguay*, contiguous with that Mountain. Eastward is another call'd St. *Christopher's*, on which is the Hermitage of that Saint; at the Foot whereof runs a Branch of the River, whose Streams drive several Corn-Mills, and one Powder-



Powder-Mill, and is the common bathing Place.

One sees very few Houses at *Lima*, of two Stories, except those in the great Square; the *Earthquakes* having taught the Inhabitants, that those sumptuous Buildings, raised with so much Magnificence by the first Founders of that City, served only for Sepulchers to their Ancestors. The *Spaniards* were forewarned of this by the *Indians*, who made a Jest of their great Designs. However, the Dread of *Earthquakes* had not hinder'd them from building of many fine Churches, and high Steeples at *Lima*. Most of the Arches, indeed, are made of Timber, or Cane-work; but so well order'd, that no Man can discern it, unless he is told it. The Walls of the great Structures are of burnt, and those of the lesser of unburnt Bricks.

The Houses have only a Ground-floor, though sometimes an upper Story made of Canes, that it may be light; and are all without Roofs, because it never rains there; being only cover'd with a single Mat, and the Thickness of a Finger of Ashes laid on it, to suck up the Moisture of the Fogs, and also to prevent being crush'd by the Fall of the Roof in Case of *Earthquakes*.

*Duret* says, the Houses are very magnificent, and take up much Room, being 80 Foot in Front, and twice as much in Depth. One enters first by a large handsome Gate into

to a large Court, where there are many Chambers and Apartments. In the Middle of this Court is another Gate, thro' which one has a Prospect of the *Jets d'eau*, and Fountains of the Garden.

The Walls of the Houses are faced on both Sides with Brick, and the middle Space fill'd with Earth five Feet in Thickness; in order to raise the Chambers the higher, and make the Windows a good Distance from the Ground, to prevent those in the Street from looking in. The Stairs are open towards the Court, and lead to Galleries, which serve for Corridores, or Walks, to go into the Apartments. The Roofs are made of rough Pieces of Timber, hid from View on the Inside by painted Mats, or Cloths tack'd to them; which has an agreeable, as well as a surprizing Effect, on those who are not accustomed to such Decorations.

Upon the Roof on the Outside, they lay Branches of Trees with the Leaves on, which they renew from Time to Time. The Apartments being thus shelter'd from the Sun, are cool in the most violent Heats. But as this Author (*Duret*) differs so much from others, with Regard to the Covering of the Houses, there is Room to suspect what he says in Relation to the Dimensions and Manner of Building.

The Walls of the City, and their Bastions, which ought to be an everlasting Work, are  
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no otherwise built. They are between 18 and 25 Feet high, and nine in Thickness at the Cordon; so that, in all the Compass of the Town, there is no one Place broad enough to mount a Cannon; which made *Fuillée* and *Frezier* believe, they were built only to oppose any Attempts of the *Indians*. According to the last Author, the Flanks of the Bastions are about 15 Fathoms perpendicular with the Curtin, and the Faces about 30, which makes the Angle of the Epaule 130 Degrees. This occasions such a fichant Defence, that two Thirds of the Curtin are upon a second Flank; and the flank'd Angles are often too acute. Those Curtins being about 80 Fathoms in Length, the great Line of Defence is of about 110. Besides this, there is neither Ditch nor Outworks. These Fortifications were raised about 1685, in the Viceroyship of the Duke of *de la Polata*, by one *Don John Ramond*, a *Flemish* Priest.

The *Spanish* Families in *Lima* amount to about 8 or 9000 Whites, the rest are only *Mestigos*, *Mulattos*, *Blacks*, and some *Indians*: These Inhabitants make, in the whole, about 25 or 30,000 Souls, including the Friars and Nuns, which take up, at least, a Quarter of the City.

Both Sexes are inclinable to be costly in their Dress. The Women, not satisfied with the Expence of the richest Silks, adorn themselves with a prodigious Quantity of Lace;

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and are insatiable as to Pearls and Jewels, for Bracelets, Pendants, and other Ornaments, the making whereof ruins both the Husbands and Gallants. *Frezier* saw Ladies, who had about them above the Value of 60,000 Pieces of Eight in Jewels.

They are generally beautiful enough, of a sprightly Mein, and more engaging than in other Places; though, perhaps, their Beauty is, in Part, owing to the hideous Faces of the *Mulattos*, *Blacks*, and *Indians*, which serve as Foils to them.

They reckon at *Lima* no fewer than 4000 Calasches, drawn by Mules, which are the common Carriages for the Gentry, and other People of Condition, in that Country. By this one may judge of the Magnificence of the Inhabitants, as we do in *European* Cities by the Number of Coaches.

But to give some Idea of the Wealth of that City, it may suffice to relate what Treasure the Merchants there exposed about the Year 1682, when the Duke *de Plata* made his publick Entry as Viceroy. They caused the Streets called *de la Merced*, or of *Mercy*, and *de los Mecadoces*, extending thro' two of the Quarters (along which he was to pass to the Royal Square, where the Palace stands) to be pav'd with Ingots of Silver, that had paid the Fifth to the King. An Ingot generally weighs 200 Marks, of eight Ounces each, are between 12 and 15 Inches long, 4 or 5 in Breadth,



Breadth, and 2 or 3 in Thickness. The Whole might amount to the Sum of 80 Millions of Crowns.

*Lima* is, in some Sort, the Repository of the Treasures of *Peru*, whose Capital it is. It was computed, some Years ago, that about six Millions of Crowns were expended there: But a large Abatement must be made at present, since the *French* have carried thither the Commodities of *Europe* at an easy Rate; and the Trade they have driven at *Arica*, *Hilo*, and *Pisco*, has diverted the Plate that came formerly to *Lima*, which is the Reason that *Lima* is now poor for what it formerly was.

*Lima* is the usual Residence of the Viceroy of *Peru*, who is no less absolute than the King of *Spain* himself in the Courts of that City, and at *Cebuquisata*, *Quito*, *Panama*, *Chili*, and *Tierra Firme*, as being Governor and Captain General of all the Kingdoms and Provinces of that Part of the *New World*. His Allowance is 40,000 Pieces of Eight yearly, exclusive of his extraordinary Perquisites. Thus when he goes in Progress into any of the Provinces, he is allow'd 10,000 Pieces of Eight, and 3000 for going only to *Callao*, which is but two Leagues distant. He has the Nomination of one Hundred Carregidores, or supreme Magistrates of considerable Places, and, in short, of all triennial Employments, both Civil and Military.

It is to be observ'd, that most Employments are given or sold only for a limited Time. Those of the Viceroy's and Presidents are generally held seven Years; some Corregidores and Governors have theirs for five, and the greater Number but for three. It is easy to see, that this Regulation was made, to prevent their having Time to gain Creatures, and form Parties against a King, who is so very remote from them, that it requires Years to receive his Orders. This Policy, however, has its Inconveniencies, and is the Cause of the ill Government of that Province; for the Officers are sure to make the most they can of their Places in the short Time they are to hold them.

The Viceroy's usual Guard is compos'd of a Company of Halbadiers, a Troop of Horse, and a Company of Foot, each consisting of 100 Men. The two last are paid by the King, and the Halbadiers are maintain'd out of a Fund left by a very rich Lady of *Lima*. There is another Company of 50 select Persons, all Men of Distinction, who walk by his Side when he makes his publick Entry. There is a Chaplain in his Palace, serv'd by six Chaplains, a Sacristian, and a Choir of Musick, paid by the King.

The Garrison of *Lima* consists only of the Militia who have no Pay from the King, except the General Officers, and the Serjeants  
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of the Foot Companies, which are in all Forty-five.

It is said, that, upon an Emergency, the Viceroy can raise 100,000 Foot, and 20,000 Horse, thro' the whole Extent of the Kingdom: But it is certain, that he could not arm the fifth Part of them.

In *Lima* are appointed many Courts for the Administration of Justice, and other Purposes, but it would be too tedious to give a particular Description of them all; and therefore we shall only take Notice of that of the Inquisition, whose Name alone strikes a Terror every where; because, first, the Informer is reckon'd as a Witness; secondly, the Accused are not allow'd to know their Accusers; thirdly, there is no confronting of Witnesses; so that innocent Persons are daily taken up, whose only Crime is, that there are some People whose Interest it is to ruin them. However, they say at *Lima*, that they have no Cause to complain of the Inquisition; perhaps because the Viceroy and the Archbishop are at the Head of that Body.

The Inquisition was settled there in the Year 1569, with all the Ministers, Counsellors, Qualificators, Familiares, Secretaries, and chief Serjeants, as it is in *Spain*. It has three superior Judges, who have 3000 Pieces of Eight Salary; and their Jurisdiction extends throughout all the *Spanish South-America*.

In order to furnish such a Number of Courts as there are in *Lima*, with Persons properly qualified, the Emperor *Charles V*, in 1525, founded an University there, under the Title of *St. Mark*, and granted several Privileges; which were confirm'd by Pope *Paul III*, and *Pius V*, who, to enlarge them in 1572, incorporated it into that of *Salamanca*. It is governed by a Rector, who is chosen yearly. They reckon in it about 180 Doctors of Divinity, Civil and Canon Law, Physick, and Philosophy, and generally near 2000 Scholars. Some proceed from thence, able enough in the scholastick and tricking Part, but very few in the practic.

*Lima* contains eight Parishes, twelve Hospitals, besides a House of Charity for poor Women, where poor Maids are married, or made Nuns; also a Foundation of above 600,000 Pieces of Eight, left by a Priest, to marry 20 Maids, with a Portion of 500 Pieces of Eight with each; the *Brotherhood of Conception* marries forty, after the Rate of 450 Pieces of Eight each.

The Monasteries (before the *Earthquake*) took up the finest and largest Part of the City. The *Dominicans* had four Monasteries; the *Franciscans* four; the *Augustins* had four; the *Mercenarians* had three; the *Jesuits* five; the *Benedictines* one; the *Minims* one; the *Brothers of St. John of God* had the Direction of the Hospital of *St. James*; the *Bethlemites* had



had two Hospitals at *Lima*, and nine Monasteries in *Peru*. These good Friars, though to outward Appearance very simple, are reckon'd refin'd Politicians, as may be judg'd by the Name of the *Quintessence of Carmelites* and *Jesuits*, given them by the People. They chuse for their Chaplain a secular Priest, whom they keep in their House at a certain Allowance; but he has no Vote among them. They are clad like the *Capuchins*, excepting that under their Beard they have a Bib a Quarter of a Yard long, ending in a Point. Their Founder, as those good Friars give out, had, eleven Years together, the Company of our Saviour visibly carrying the Cross. The other Apparitions and Revelations, which they place to his Account, and publish both by Word of Mouth, and by Pictures, are of the same Reputation.

The Nuns are not quite so numerous at *Lima* as the Friars; there were only twelve Monasteries of them, which contain about 4000 Nuns, among whom there are four or five Monasteries of very regular religious Women; but the Friars are much more numerous.

To these we may add a House founded by the Archbishop *Toribio* for Women divorced. It is incredible, says *Frezier*, to what an Excess that Abuse has been carried. There are People daily unmarried, with as much Ease as if Marriage was nothing but a civil Contract,

tract, upon bare Complaints of Misunderstanding, Want of Health, or Content of Mind ; and what is still more amazing, they afterwards marry others.

The penitent Women had also a Place of Retreat, but *Frezier* did not think it sufficiently fill'd with them ; which he imputes to the little Scruple they make in that Country of Libertinism, or the little Care there is taken to curb it.

By the great Number of Monasteries and religious Houses of both Sexes, one wou'd imagine *Lima* to be a Place much addicted to Devotion ; a great Mistake ! For most of the Friars are so given to Licentiousness, that even the Superiors and Provincials draw from the Monasteries considerable Sums of Money, to defray the Expences of worldly Pleasures, and sometimes of such open Lewdness, that they make no Scruple to own the Children they have gotten, to keep about them those undeniable Proofs of their disorderly Life, to whom they often leave, as an Inheritance, the Habit they are clad in, which sometimes descends beyond one Generation.

The Nuns likewise, except of three or four Monasteries, have no more than an Appearance of the Regularity, which they only owe to the Inclosure : For, instead of living in Community and Poverty, according to their Vow, they dwell apart at their own Cost ; with a great Retinue of *Black* and *Mulatto* Women

Women Slaves and Servants, whom they make subservient to the Gallantries which they carry on at the Grates.

To do the *Jesuits* Justice, both *Frezier* and *Fuillée* except them out of the Number of irregular Regulars, declaring, that they live after a more exemplary Manner; they do not, however, yield to any of the other Orders in Point of Wealth.

To give the Reader some Idea of the Superstition of the *Romanists* in that Country, we shall divert him with an Account of the Feast of St. *Francis* of *Affisium*, which is none of the least in the Year; and was celebrated at *Lima* the 4th of *October* 1713, two Days after *Frezier's* Arrival there; for the *Spaniards* being possessed and infatuated by the Friars, especially the *Franciscans* and *Dominicans*, look upon the Founders of these two Orders as the greatest Saints in Heaven. The Veneration they pay them extends to the Habits of their Orders, which they esteem much beyond the other Monastical Orders.

They chiefly believe, that they obtain great Indulgences by kissing the Habit of St. *Francis*. The *Franciscans*, to keep up that Notion, send some of their Friars into some of the most frequented Churches, to give their Sleeves to kiss to those who are hearing Mass. Even the Questing Brothers presume to interrupt People in their Prayers, to have that Honour done them. But, to heighten the

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general Respect paid to their Order, and render its Grandeur more conspicuous to the Publick, they, on the Festival of their Founder, make magnificent Fire-works and Processions, and embellish their Cloisters, within and without, with the richest Things they can come at.

The Festival began at the Evening Song, by a Procession of the *Dominicans*, in which ten Men carried the Figure of St. *Dominick*, going to visit his Friend St. *Francis*. He was clad in rich Gold Stuffs, and glittering with small Stars of Silver, strew'd upon him, that he might be seen at a Distance. St. *Francis* being inform'd of the Honour his Friend intended him, came to meet him as far as the Square, which is half Way. Being arriv'd before the Palace-Gate, they complimented one another by the Mouths of their Children; for though they made Gestures, they had not the Advantage of speaking. The Latter, being more modest than the Former, came in his *Franciscan* Friar's Cloth; but, amidst that Poverty, he was encompassed by an Arch of Silver Rays; and had, at his Feet, such a Quantity of Gold and Silver Vessels, that 18 Men bow'd under the Load of them.

The two Images were receiv'd at St. *Francis's* Church-door, by four Giants of different Colours, White, Black, Mulatto, and *Indian*, which came to the Square to dance before the Procession. They were made of Basket-work, cover'd



cover'd with painted Paper; but in Fact, to consider their Figure, Masks, Hats, and Perukes, were mere Scarecrows. In the Midst of the Giants was the *Taraska*, a chimerical Monster, known in some Provinces of *France*, bearing on its Back a Basket, from which issued a Puppet, or Maulkin, that danced and skipped to divert the People. At length they enter'd the Church, amidst a great Number of Tapers and little Angels, two or three Feet high, set on Tables, like Puppets, among large Candlesticks, each the Height of six or seven Feet.

At the Close of the Evening, there were Fire-works in the Square before the Church, consisting of three Castles, each 8 or 9 Feet wide, or 15 or 16 in Height. On the Foot of one of them was a Bull, and on another a Lion. The Steeples of the Church were adorned with Ensigns and Streamers of all Colours, and illuminated with Lanthorns. They began with throwing up Sky-rockets, small and ill made. Then they play'd off some running Fires, one of which separated in three long Squibs, which rested on the Middle and two Ends of the Line, leaving two little Globes of bright Fire in the two intermediate Spaces. This was the only Fire-work that deserv'd to be taken Notice of. At last a Man on Horseback descended from a Steeple by a Rope, and came to attack, in the Air, one of their Castles; then they set Fire to it, and successfully

sively burnt the Giants, and the *Taraska*, or Monster ; and so all was reduced to Ashes.

Next Day there was a long Sermon, and Musick, accompanied with Singing of *Spanish Motetts*. The Monastery was open'd also to the Women ; and at Night another Procession carried St. *Dominick* home. On which Occasion, altho' it was Day, there was another Fire-work, where a Giant came down by a Rope, to attack a Castle, and fight a Serpent with three Heads. But in their Shews there is neither Fancy, Design, nor Subject ; which shews what little Taste and Genius there is among them.

The Magnificence of these Solemnities, shews in how great Esteem those Friars are, since, by Means of their Wallets, or begging, they get enough not only to maintain above 1500 Persons, as well as Friars or Servants, in four Monasteries, and to erect Structures truly sumptuous for that Country, (the Monastery of St. *Francis* being the finest and largest in all *Lima*) but we see have enough left for Expences of mere Ostentation ; which have sometimes amounted to 50,000 Pieces of Eight, out of what is properly the Right of the Poor, of whom there is no Want there.

One need not, however, be surpriz'd at these Expences, if we consider the extraordinary Product of the Quest ; since the great Monastery, alone, has twenty-four Questors

at *Lima*; one of whom, who died in 1708, had, in 20 Years, gather'd 350,000 Pieces of Eight. Besides, it is very common, among the *Spaniards*, to wrong their nearest Relations of considerable Sums of Money, and even of their lawful Inheritance, in Favour of the Church and their Monasteries, which they call, *Making their Soul their Heir*.

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*An Account of the EARTHQUAKE,  
which happen'd at Lima, in the  
Night of the 28th of October,  
1746.*

THE Kingdoms of *Peru* and *Chili* are extremely subject to *Earthquakes*: But of all which have happen'd since the Conquest made of those Countries by the *Spaniards*, it may be truly affirm'd, that none ever broke out with such astonishing Violence, or hath been attended with so vast a Destruction, as that which happen'd lately in this Capital, where, undoubtedly, it had its Origin, and from thence was propagated an hundred Leagues Distance Northwards, and as many more to the South all along the Sea-coast. This surprizing Convulsion of the Earth arriv'd in the Night of the 28th of October,

*tober, 1746, a Day dedicated to St. Simon and St. Jude.*

According to the best regulated Clocks and Watches, this fatal Catastrophe besel this Place 30 Minutes after Ten at Night; when the Sun was in five Degrees ten Minutes of *Scorpio*, and the Moon in not much less of *Taurus*; so that those Planets wanted very little of being in Opposition, as they actually were in five Hours and twenty-two Minutes afterwards, *viz.* at Three of the Clock, and fifty Minutes on the 29th in the Morning; an Aspect which, by constant Observation, hath prov'd unfortunate in this Climate: For, under its Influence, these convulsive Kinds of Agitations in the Earth do most usually happen; and tho' they often prove gentle enough, yet every now and then they strike Terror in the Natives by their violent Shocks. But, on this Occasion, the Destruction did not so much as give Time for Fright; for, at one and the same Instant, almost, the Noise, and the Shock, and the Ruin were perceiv'd together; so that in the Space of four Minutes, during which the greatest Force of the Earthquake lasted, some found themselves buried under the Ruins of the falling Houses; and others crush'd to Death in the Streets by the tumbling of Walls, which, as they ran here and there, fell upon them. However, the major Part of them happen'd to be preserv'd, either in the hollow Places which the Ruins left, or on Top of the very Ruins



Ruins themselves, without knowing how they got up thither ; as if the Divine Providence had thus conducted them, that they might not perish : For no Person, at such a Season, had Time for Deliberation ; and even supposing he had, there was no Place of Retreat in which to trust. For the Parts which seemed most firm, sometimes proved the weakest ; on the contrary, the weakest at Intervals made the greatest Resistance ; and the general Consternation was such, that no one thought himself secure, till he had made his Escape out of the City.

The Earth struck against the Edifices with such violent Percussions, that every Shock beat down the greater Part of them ; and these taring with them vast Weights in their Fall, (especially the Churches and high Houses) compleated the Destruction of every Thing they encounter'd with, even of what the *Earthquake* had spared. The Shocks, although instantaneous, were yet successive ; and at Intervals Men were transported from one Place to another, which was the Means of Safety to some, whilst the utter Impossibility of moving, preserv'd others ; that thereby it might visibly appear, that the Divine Justice sought nothing more from them than their Repentance and Amendment ; for it caus'd its Mercy to shine forth in so resplendent a Degree, that to an extraordinary Providence alone can be ascrib'd the Preservation of so many Lives.

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To elucidate this, it must be observ'd, that there are 3000 Houses, which make up the 150 Islands, or Squares of Buildings (which are made by the Streets crossing each other in streight Lines) contain'd within the Walls of the City. These with the others near adjoining, and the Shops where Tradesmen and poor People dwell; together with those in the Suburbs or Borough of *Lazarus*, on the other Side of the River, (to which there is a Passage by the great Bridge) amounting in the whole to a Number sufficient to contain 60,000 Persons, for so many there are computed to be constantly resident in this City. Now, although scarce twenty Houses were left standing, yet, by the most exact and diligent Search that could be made, it does not appear, from the Lists taken of the Dead, that the Numbers of them had amounted to much more than 1141 Persons.

*Lima* had arriv'd to as great a Degree of Perfection, as a City situated at such a Distance from *Europe*, and discourag'd by the continual Dread of such Calamities, was capable of. For, altho' the Houses were but of moderate Height, being confin'd to one Story only, yet the Streets were laid out with the exactest Regularity, and adorn'd with all that Beauty which a true Symmetry could give: So that they were equally agreeable to the Sight, as commodious to the Inhabitants; and display'd as much Elegance as if all the  
Ornaments

Ornaments of the best Architecture had been bestow'd upon them. To this may be added the delightful Appearance of many handsome Fountains, for whose Supply the Water was convey'd through subterraneous Aqueducts; and the towering Height of the Churches, and Structure of the religious Convents and Monasteries. It may be affirm'd, that the Magnificence of these Edifices, if it did not exceed, at least might rival the grandest Fabricks, of this Kind, in the whole World, for the Beauty of their Design, their Profiles, their Cemeteries, the Largeness of their Naves, their Cloisters and Stair-cases, were such, as they had no Cause to envy any for Size or Elegance.

There were seventy-four Churches, great and small, beside publick Chapels, and fourteen Monasteries, as many more Hospitals and Infirmaries; in all which the Richness of the Materials might vie with the Perfection of the Work; whether we consider the Paintings and Pictures, or the Ornaments of Lamps, and Vessels of Silver; the exquisite Works of Gold and Pearls, with the precious Stones in the Custodiams of the Host, so call'd, because in them is kept the consecrated Wafer of the Sacrament; also the Crowns and Jewels with which they adorn the Images of their Saints. The Moveables and inside Furniture of the principal Houses, in Pictures, Prints, Escrutores, Looking-glasses, Hang-

No. III. G ings,

ings, and other Curiosities with which they abounded, together with the vast Services of wrought Plate, had made it a Repository of the most valuable Things that could be procured from all Parts; for the Desire of Gain had brought from the most remote Parts, every Thing that Luxury or Vanity could fancy, for sake of exporting Part of its immense Wealth in Exchange.

But all this beauteous Perspective, which with so much Cost had been the Care of many Years to bring to so much Perfection, being in an Instant reduced to Dust, manifested before its Time the natural Frailty and Weakness of its Constitution. No Relation whatsoever is capable of conveying to the Mind an Idea of the Horror with which the Sight of these Ruins strikes the Beholders. The very Sufferers themselves are amazed at what they could not comprehend; and therefore a particular Recital of the Calamity is not only utterly inexplicable by Words, but it is impossible even to form any Notion of the horrible Destruction which on all Sides appeared to View. What Force of Expression is capable of making the Reader comprehend the dreadful Astonishment which the Mountains of Ruins occasion, that hinder all Entrance to the Cathedral Church, whose elegant Structure was destroy'd by its own Greatness; for the high Towers, with which its Summit was adorn'd, splitting to Pieces, and tumbling on  
its



its Roof, utterly demolish'd all the Arches, and other Parts of the main Body, as far as they reach'd, beside those that fell of themselves; so that the Rebuilding of it is not only rendered impracticable, but it will require an immense Expence only to clear away the Rubbish. In the same lamentable Condition are the other great Churches of the five religious Orders, where the Parts left standing are yet in such ruinous Circumstances, that it would be better to pull them quite down, than to think of repairing them. Dismal is the Sight of all the Monasteries in Ruins, the religious Orders without Support, the Revenues assign'd for that Purpose (consisting principally of the † Quit-Rents of the Houses in the City) all lost. So that now they are destitute of all other Maintenance than such as the Assistance of their Relations, or the charitable Compassion of pious People, can administer, without any the most distant Prospect or Hopes of ever being reinstated again in Convents.

Indeed, (says the Author of this Relation) human Understanding is at a Loss to pene-

† It is customary in all the *Spanish West-Indies*, for the Proprietors of Houses to settle a Tax on them, sometimes on one Floor thereof, sometimes on two, or more, for the Payment of certain annual Sums to a favourite Priest, or Priests, which they call *Capellaneas*, or *Chapls*, by which it often happens, that the Tax of the House is more than the Rent of it; and tho' they should become untenanted, yet the Priests enjoy their Quit-Rent, and will oblige the Proprietor to keep them in Repair.

trate the inscrutable Judgments of God, in thus permitting the Destruction of his Temples, the Affliction of his Spouses, (so the Papists call the Nuns) and so vast an Ecclesiastical Patrimony to be lost. But it is still more difficult (considering all that Havock) to consider how so many Lives came to be preserv'd; especially when in the little Monastery of *Carmen*, or *Carmel*, out of twenty-one Nuns, whereof that House consisted, twelve perished; which, indeed, was the largest Number of Nuns that suffered on this Occasion, for in the other great Nunneries they did not amount to so many, although in some of them the Number of Maid-Servants who perished, were more. And in the Hospital of *St. Anne*, which was a Royal Foundation for the Relief of *Indians* of both Sexes, 70 of the Patients lost their Lives, having been buried, at the Beginning of the *Earthquake*, by the Roofs of their grand Halls of their several Apartments, which fell upon them as they lay in their Beds, no Persons being able to give them Assistance.

In short, the Ruins of this City are such, that the Place is render'd uninhabitable, as much from Inconveniency as Horror. The Streets, all choak'd up with the fallen Fragments of the Walls, scarce afford a Passage for Communication; and this is more sensibly perceiv'd in those Parts where it was judg'd to be most necessary, which is at the  
Foot

Foot of the Bridge; where the magnificent Arch, which stood at its Entrance, and was one very valuable Part of its most regular Architecture, is fallen down. It was but a few Years ago, that the Marquis of *Villa Garcia*, in order to add further to its Beauty, had caus'd to be erected upon it a most elegant and grand Statue of *Philip* the Vth, on Horse-back, in a military Habit, which appear'd in exquisite Proportion at that Height.

In fine, one cannot stir a Step without encountering some fresh Motive for the most melting Compassion. The Palace of the Viceroy, in which were contained the Courts of Judicature of the *Royal Audiencia*, or Court of Judges, the Tribunal of Accounts, the Treasury, and all other Offices for Affairs of the Government, are render'd incapable of being inhabited, as every one of the Out-buildings of subsisting any longer. The Tribunal of the holy Office of Inquisition is become utterly unable to proceed in the Course of Business; the several Apartments of the House being totally overthrown, as well as that magnificent and beautiful publick Chapel which belong'd to it. The Royal University, the Colleges, and the other Edifices of any Consideration, now only serve, with the menacing Ruins that are left of them, to revive the melancholy Remembrance of what they were.

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*The Destruction of Callao by the  
EARTHQUAKE, and the Irrup-  
tion of the Sea.*

GREAT, indeed, was the Destruction of *Lima*; yet still some Remains were left, some Traces of its former Magnificence. Not so it fares with *Callao*, its Port and Garrison, where the very Objects of the Misfortune are vanish'd quite out of Sight; not the least Sign of its former Figure is now to be seen: On the contrary, vast Heaps of Sand and Gravel occupying the Spot of its former Situation, it is, at present, become a spacious Strand extending along that Coast. Some few Towers, indeed, and the Strength of its Walls, endur'd a-while the whole Force of the *Earthquake*, and resisted the Violence of its Shocks; but scarcely had its poor Inhabitants begun to recover from their first Fright, which the dreadful Ruin and Devastation had occasion'd there, (and how great that was, is not to be known) when suddenly the Sea began to swell, and swelling rose to such a prodigious Degree, that in falling from the Height it had attain'd (altho' *Callao* stood above it on an Eminence, which however imperceivable, yet continues still increasing all the Way



to *Lima*) it rush'd furiously forward, and overflow'd its antient Bounds with so vast a Deluge, that foundering the greater Part of the Ships which were at Anchor in the Port, and elevating the rest above the Height of the Walls and Towers, drove them, and left them on dry Ground far beyond the Town; at the same Time it tore up, from the Foundation, every Thing that was in it of Houses and Buildings, excepting only the two grand Gates, and here and there some small Fragments of the Walls themselves; which, as Registers of the Calamity, are still to be seen among the Ruins and the Waters, a dreadful Monument of what they were.

In this raging Flood were drowned all the Inhabitants of the Place; who, at that Time, might amount to 5000 Persons of all Ages, Sexes, and Conditions, according to the most exact Calculation that can be made. Such of them as could lay hold of any Pieces of Timber, which the general Wreck afforded, floated about for a considerable Time, and kept themselves above the Waves: But those Fragments, which offer'd them Assistance in their Distress, proved, by their Multitude, the greatest Occasion of their Destruction; because, wanting Room to move in, they were continually striking against each other, thro' the Agitation of the Water; and thus beat off those who had clung to them.

By

By some of those who were so happy as to save themselves, amounting at most to 200, we have been inform'd, that the Waves, in their Retreat, encountring one another, by Means of the Obstacles which the Water met with at its Reflux, surrounded thus the whole Town, without leaving any Means for Preservation; and that, in the Intervals, when the Violence of the Inundation was a little abated, by the retiring of the Sea, there were heard the most lamentable Outcries of the wretched Inhabitants in their Distress.

Witnesses likewise of this Account, and the Shrieks that were heard, are those who, being on Board the Ships at the Time when, by the great Elevation of the Sea, they were carried over the Town, had the Opportunity of escaping unhurt. It will not be difficult to conceive the dismal Confusion and Streights which those miserable People found themselves in, when we consider, that they only preserv'd their Lives from each present impetuous Attack of the Sea, in order to prolong the dreadful Affliction, which the Apprehension of inevitably losing them at the Return of the next overwhelming Wave, must infallibly have occasion'd.

There were twenty-three Ships, great and small, at Anchor in the Port at the Time of the *Earthquake*, and of these some were stranded, being four in Number, *viz.* the *St. Firmin* Man of War, which was found in the low Grounds

Grounds of the *Upper Chacara*, the Part opposite to the Place where she rode at Anchor ; and near her the *Sant Antonio*, a new Merchant-Ship, just arriv'd from *Guiaquil*, where she was built ; the Vessel of *Don Adrian Corzi* rested on the Spot where before stood the Hospital of *St. John of God* ; and the Ship *Succour*, just arriv'd the same Evening from *Chili*, was thrown up towards the *Cordon Mountains*, both one and the other of them at great Distances from the Sea ; and all the rest were founde'r'd.

The great Vaults, where the Commodities brought from other Parts (which supplied *Lima*, and made up a great Part of its Commerce) used to be deposited ; such as Corn, Tallow, Jars of Wine, and Brandies, Cables, Iron, Timber, Tin, Copper, and the like Effects, and were at this Time well fill'd with them. The Wealth of the Town itself was likewise very considerable ; and no small Quantity of Money was then circulating there. To these if we add the Moveables, the Ornaments of the Churches, which abounded in Curiosities of Gold and Silver ; lastly, the Apparatus of Provisions and Munitions of War belonging to his Majesty, which were kept in the Royal Store-houses and Magazines : All these Articles put together, swell greatly the Amount of the actual Loss, without reckoning the Demolition of the Buildings, and the Value of the Quit-Rents.

In that dismal Night, whilst all the Inhabitants of *Callao* perish'd, those of *Lima* were distracted with the Apprehension of their own Danger, and the Horror of their Minds, occasion'd by the frequent Repetitions of the *Earthquake*, which continued, without Intermission, the whole Night; and by this Means it happens, that the exact Time of its Duration is not determinable. But this Horror was greatly encreased by the News of the dreadful Tragedy then acting at *Callao*, which far exceeded all the great *Earthquakes* that had before happen'd there: For altho' they were sometimes the Occasion of Floods in that Garrison, yet those Floods did no real Damage to the Town, or the Inhabitants, farther than putting them in a Fright. The Truth of this dismal Story was confirm'd next Morning by the Soldiers, who, by Order of the Viceroy, had been there for Information.

By this Time also many were continually arriving, of such as were sent thither to make Enquiry how Things stood, on the Part of those who had Dealings with the People of that Place, or were concerned in the Trade and Cargoes of Ships. As these Persons were not present themselves at this Scene of Woe and Destruction, they only brought an Account of what they could collect from those who had saved their Lives; and, except some very few, were all Fishermen and Sailors. These,



These, after having been driven about several Times as far the Island of *St. Laurence*, more than two Leagues distant from the Port, found Means to save themselves upon Planks, some of them were accidentally cast upon the Sea-shore, others upon that Island, and thus were preserv'd. But the excessive Greatness of the Calamity which had befallen *Callao*, helped, in some Measure, to mitigate the Grief occasion'd by the deplorable Circumstances to which they were reduced themselves. Every one return'd Thanks to God, for the great Mercy shewn to him in his own particular Preservation.

Broad Day at length appear'd, and the Light, which was never long'd for with greater Anxiety, instead of administering Consolation, increas'd the Affliction, and brought a deeper Gloom on the People; and, at one View, distinctly discover'd all that mighty Ruin, which the Confusion of their Fright did not permit them to frame any just Idea of; and this Calamity would probably have put a final End to every Thing, (their Despair sinking them more, if possible, than the Shocks of the *Earthquake* had done their City) had not Heaven inspir'd the Viceroy with Resolution, Vigilance, and Activity for the publick Service on this momentous Occasion. He appear'd on Horse-back in all the Streets, without any Apprehension of his own Danger, from the impending Fragments of Walls

that were yet standing ; and who, after having pass'd the Night without any Regard to the Safety of his own Person, which he freely expos'd wherever he judg'd his Assistance necessary. Having taken a View of the Ruins, and consider'd the Whole, he return'd to the great Square, with a Resolution to dedicate himself to the laborious Task, of immediately dispatching all the provisionary Orders which the Nature of the Case requir'd.

As the first Thing to be dreaded was the Want of Corn, all that which was deposited in the Vaults of *Callao* having been destroy'd, the Ovens for baking Bread in *Lima* likewise all demolish'd, and the Conduits thro' which the Water was convey'd to the Mills, all choak'd up, so that, by these Means, this necessary Relief was obstructed ; he immediately therefore order'd three Soldiers of his Guards to the Governors of the adjacent Districts, with Orders to remit all the Corn which should be found in their respective Governments. He gave Orders, at the same Time, for assembling the Bakers of the City together, to know of them what Assistance they wanted, to enable them to repair their Ovens, and carry on their Trade. To which Purpose he commanded the Water-bailiff and Super-intendant of the Pipes, to examine and repair all the Aqueducts, Conduits of the Mills, and Fountains of the City, that the Course of the Water might not be obstructed ;

he likewise caused it to be notified to the Persons whose Business it is to provide Flesh-meat, (for they have no Butchers, but the landed Gentlemen take their Turns to serve the City with live Cattle for the Slaughter) that they should continue to kill Animals as they did before.

His Excellency likewise granted to the Farmer of the Reservoirs of Ice as many Horse-Soldiers as he requir'd, to enable him to procure sufficient Hands to clear the Roads, by which that great Refreshment is brought to the City, and which had been render'd quite impassable by the *Earthquake*. In Consequence of which good Resolutions, the City was well supplied with Provisions.

Nor was his Attention less to the Relief of the impress'd Men, who were in the Island of *Callao*, condemn'd to the digging of Stone in those Quarries, for the Works of the Garrison; and therefore order'd a Number of small Barks to be got ready to transport them over to the Continent, and to put them in a Place of Safety; all which was effectually executed. By this Means also were brought back many of those who had sav'd themselves in this Island from the Disaster of *Callao*; and by this Assistance had an Opportunity of curing Bruises and Hurts receiv'd from the repeated Strokes of the Waves, and the Blows of the ruined Pieces of Wreck.

Having

Having thus provided for the Relief of the Living, his next Care was to bestow Burial on the Bodies of those who lost their Lives among the Ruins of the City. For this Purpose he caus'd the Fraternity of the Order of Charity to be summon'd together, and gave Directions, that, with the Assistance of the City Aldermen, they should collect and convey the Corps which should be found, to the several Churches and Convents, with whose Principals he had already concerted their Reception.

The Viceroy likewise used his utmost Endeavours to prevent the Loss of the Royal Property. For this Purpose he order'd the Captain of the Arsenal of Arms of his Palace, immediately to cause the Ruins thereof to be clear'd away; and taking out the military Weapons, to convey them to some other Place of Security. He likewise caus'd a Survey to be made of the Ships that were sav'd, and of the Condition they were in; pursuant to which he was soon inform'd, that the Corn and Tallow on board the *Succour* was sav'd, which would afford some Supply to the City; and that the St. *Firmin* Man of War was in such a Situation, that she must be took to Pieces, it being impracticable, otherways, to make any Thing of her. He likewise issued a Proclamation, directing the Superintendant of *Callao*, the Royal Officers in waiting at that Garrison, the Lieutenant-General of the Artillery,



Artillery, and the Captain of the Arsenal of Arms, to take a Survey of all such Stores and Effects belonging to their respective Branches of Business as had been sav'd, and that they should use proper Means to collect and secure the same as Part of the Royal Property, in Conjunction with the Town-Major of the Garrison, who was to attend upon them with Soldiers and Labourers hired for that Purpose.

A Guard was likewise placed on the Royal Mint, which was entirely in Ruins; and where, at that Time, there were very large Quantities of Gold and Silver belonging to the King, and other particular Persons. This Wealth lying so much expos'd, was liable to be stolen, as the Place was at a considerable Distance from the Royal Treasury, which being near the Viceroy's House, was in less Danger.

They sent Word from *Callao*, and the Villages along its Coasts, that the dead Bodies of such as had been drowned by the Inundation, were continually driving to Land; and that the Sea had thrown up a great Quantity of the Goods, and other valuable Effects, which had been set adrift by the several Wrecks and Inundation of the City. They gave Notice also, that the Shores were throng'd with a great Concourse of People, whom the Desire of Plunder had brought together. Upon which his Excellency gave Orders to the Corregidor to go with a great Number of Soldiers,

Soldiers, and others, to the Villages of *Misaflores* and *Chorrillos* in the Jurisdiction of his Commad; there to cause all such dead Bodies as he should meet with along the Coast, to be interr'd; and to secure all the Goods which the Sea was continually casting up. The same Orders were given to the Town-Major of *Callao*; and also to the Tribunal of the Consulate of Merchants, directing them immediately to take the properest Measures to prevent the Embezzlement of such Effects, and to collect together all that could be found, in order to restore the same to the Persons who should afterwards appear to be the Proprietors, according to the Rules of Justice, and Laws of Commerce. And that none might presume to steal or plunder any of the Effects which were so collected together, a Proclamation was issued, making it Death for any Body to purloin the least Trifle belonging to them; and to enforce this Edict, two Gibbets were immediately erected at *Lima*, and two others on the Strand of *Callao*; that by the Sight of these Engines of Punishment, all evil-minded Persons might be deterr'd from secreting, and not discovering such Goods as they had pick'd up.

Farther, the Viceroy augmented the Number of Soldiers in the two Companies of Horse and Foot Guards, and paid them in Proportion; and appointed three several Corps of these Soldiers, continually to patrol about

about the City, in order to prevent Murders, Robberies, and other Mischiefs, which the desolate Condition of the Houses might facilitate, and which the necessitous Circumstances of many might excite, especially among the incorrigible Mob and common People, on whom the most dismal Spectacle, which they had of this Disaster before their Eyes, could not make any Impression; and therefore it was fit that their Insolence should be restrained by the Fear of incurring a rigorous Punishment.

By these provident and well-regulated Dispositions, his Excellency very much mitigated the Calamity, which, in Cases of this Nature, is usually rather increas'd by the Confusion than the Evil itself. And, indeed, nothing less than an exact Obedience to his Orders, could have preserv'd the Authority and Respect due to him, when engag'd in quelling that impetuous Tumult, wherewith the City was distracted by the false Rumour which at one and the same Time was spread thro' every Part of it; namely, that the Sea was rising and advancing swiftly towards it: In-somuch that the People ran in confus'd Multitudes towards the Mountains, there to seek a Place of Safety.

The Hurry with which every one push'd forward was so irresistible, that even those, who, from the Circumstances of the Report which render'd it incredible, and the Know-

ledge of much such another Accident, which happen'd in the Year 1686, did not believe it, suffer'd themselves, however, to be carried on, or rather were impelled by the general Torrent. The People were almost dead with the Fright and Fatigue; and some of them actually died, notwithstanding the Daylight, which yet remained, might have convinced them of their Error; but the first Report still prevailing, confirm'd them in a Resolution still to proceed.

In Truth, the Consternation their Minds were in on Account of the Disaster at *Callao*, made their Fright thus get the better of their Reason; and so perplexed their Thoughts, that they could not call to Mind how high the City stands in Respect to the Sea; for in the great Square the Ground is elevated near 170 Yards above the Surface of the Ocean, and still continues rising in the Parts that lie towards the East; and therefore that it was impossible such a Thing could happen in a Place where the Land lay so high above the Sea.

His Excellency considering the dangerous Consequences that might attend this unlucky Incident, mounted his Horse, resolving to follow after, and penetrate into the Midst of the confused Multitude; and no sooner was his Presence seen among them, but the Up-roar was quell'd, and the tumultuous Cries and Shrieks of the People were hush'd in a Moment;



Moment; and what neither the strict Relation of conjugal Love, the natural Tenderness for their Children, nor the Thoughts of abandoning their Estates, could effect, the Word of Command of one single Man immediately brought about. Every one halted on the Spot; and beginning to perceive the whole Delusion, which they were incapable of observing before thro' their Fright, it was the most moving Spectacle that could be. In their Retreat back again, the Separation of Persons nearly related, and the Moanings of Mothers for their Children, occasioned another Scene of fresh Confusion, which render'd them insensible of their Fatigue and Weariness. Thus he deliver'd the People out of a Danger which might have prov'd almost as fatal as that of an Inundation.

His next Care was, to provide for the Relief of the Monasteries; for which Purpose he gave Orders that they should be supplied on their several Credits with Bread and Fleshmeat; and that the Aldermen of the City should divide among themselves the Care of all those Fraternities; and to demolish such Parts of their Convents as threaten'd Ruin, and to protect them from all such Insults as they might be subject to from Thieves, &c.

His Attention was next turn'd to the rebuilding of the City. With this Intent he appointed *Don Lewis Godin*, of the Royal Academy of Sciences at *Paris*, and Professor of

the Mathematicks in the University of *Lima*, to project a Plan and Design of the Proportions, Form, and Rule to be observ'd in the building of the Houses, and other Edifices of the City, in such a Manner as that the Inhabitants might not, for the future, be in Danger from such violent *Earthquakes*, which ought always to be dreaded ; or, at least, that the Damage and Havock, occasion'd by those Convulsions of Nature, might not be so great as what they had lately experienced.

In the next Place he applied himself to the restoring *Callao* as soon as possible. He went thither in Person, carrying with him the aforesaid *Don Lewis Godin*, to survey all that Ground, and to find out a Situation whereon to erect a competent Fortification, which might serve for a Defence of the Marine against the Invasion of Pirates, or any other Enemy ; likewise to chuse a Place where best they might make Vaults, and build Warehouses for depositing Effects which might be imported from Abroad, that so there might be no Stagnation in Trade. Having given Directions in so necessary a Business, he return'd to the City, to concert the proper Measures for putting what he had resolv'd upon in immediate Execution.

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*The Extent of the EARTHQUAKE ;  
with the Warnings and Prophe-  
cy concerning it.*

THE Shocks which were felt that fatal Night, every Quarter of an Hour, or oftener, were repeated three or four Times, at least, every Day during the succeeding whole Month of *November* ; some of them attended only with Noises, but others with excessive Tremblings ; a Sign that there still remain'd Plenty of Matter proceeding from Minerals collected in the Subterranean Cavities that are in the Neighbourhood of *Lima*, and Port of *Callao*, where the greatest Havock was made. For it appears from the Accounts which the Posts brought from the Coasts lying North and South of that Place, that the farther the Parts were remov'd from this Center, the less the *Earthquake* was perceiv'd ; and that not one single Person had been lost, either in the Towns near the Sea, or within Land, except in *Guancavilica*, where excessive Shocks were felt, and Noises heard.

In Effect, the Ruin of Buildings extended on one Side no farther than to *Caniete*, a maritime Town about 80 Miles South-East of *Callao* ; and on the other to *Chancay*, a maritime

maritime Town North-West of *Callao*, and *Guara*, a Port about 24 Leagues North North-West of the same; at which last Place the vast strong Bridge that was built over the River fell to Pieces. But as this was the necessary Passage from all the Valleys below, the Viceroy immediately dispatched an Order to the Corregidor of that Jurisdiction instantly to proceed to the rebuilding of it. Nor was there any Account of any Damage done by the Irruption of the Sea to any of the Towns through the utmost Extent of either Coast; excepting only the unfortunate Wreck of the Ship *Conception*, which in its Passage from *Manama*, being at Anchor in the Port of *Tanta*, was so suddenly surprized, that she was foundered before she had any Time to help herself. But the *Soledad* had better Fortune on the Coast more beyond in the Port of *Mafia*; for the Captain perceiving the Retreat the Sea was making from the Shoar, had Time to take the Precautions necessary to preserve her from receiving any Damage.

The *Spanish* Author of this Relation here makes some moral Reflections on the dreadful Marks of Divine Power so eminently visible in this terrible Destruction; and then adds, that in proportion to the Evil God has been graciously pleased to provide us Remedies; and if our own Hardness of Heart had not withheld his Grace from us, we might perhaps



perhaps have avoided the Misfortune by our Amendment of Life, and an humble Recourse to his Mercies: For the Deity afforded us all proper Admonitions for that Purpose, and which in the natural Way, by Means of various fiery Exhalations, which in several preceding Nights were observed towards *Callao*, and visible from the Island near it; and then again by other Methods, in which the Merit of our Punishment is more easily discernible.

What I mean is, a Prediction of all this lamentable Catastrophe, (which remained in the Hands of a very few Persons; and that too without being the least regarded) utter'd, many Months before it happen'd, by our Mother *Teresa of Jesus*, a Nun in the Monastery of *Barefots of St. Joseph* in this City; with repeated and most efficacious Asseverations of what was to come to pass; to which she added, that her Life would not last long enough for her to experience the sad Event; and in Fact she died at the Age of above a Hundred Years, the 15th of the same Month of *October*, a Year before the Earthquake happened. To demonstrate the Truth of this, Informations are now actually making, which will contain the whole Particulars of the Case; altho' at that Time the extreme Earnestness with which she delivered her Predictions, was look'd upon as a Mark of the Failure of her Understanding at that advanced

ced Age: For it was the Divine Will that the very Lights by which human Wisdom (ever circumspect in Cases of the like Nature) was used to govern itself, should be obscur'd through want of such Notice †, in order thus to carry the Blow into Execution; which Proceeding we ought to believe is convenient for us, without searching farther into the hidden Judgments of its high Design.

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*An Account of a dreadful EARTH-  
QUAKE, that happened at Port-  
Royal in Jamaica, on June the  
7th, 1692; in two Letters  
written by the Minister of that  
Place.*

*The first Letter dated June 22, 1692.*

*Dear Friend,*

I Doubt not but you will, both from Gazettes and Letters, hear of the great Calamity that has befallen this Island by a terrible

† Rather through a Disregard of such Notice; for if there was such a Prophecy, as is pretended, Notice was given. But it looks very suspicious, that God should reveal a Warning of his Judgments to no Effect. Were the Natives

ble *Earthquake*, on the 7th Instant, which hath thrown down almost all the Houses, Churches, Sugar-works, Mills, and Bridges, through the whole Country. It tore the Rocks and Mountains, destroy'd some whole Plantations, and threw them into the Sea. But *Port-Royal* had much the greatest Share in this terrible Judgment of God. I will therefore be more particular in giving you an Account of its Proceedings in this Place, that you may know what my Danger was, and how unexpected my Preservation.

On *Wednesday* the 7th of *June* I had been at Church reading Prayers, which I did every Day since I was Rector of *Port-Royal*, to keep some Shew of Religion among a most ungodly debauched People; and was gone to a Place hard by the Church, where the Merchants used to meet, and where the President of the Council was, who acts now in Chief till we have a new Governor. This Gentleman came into my Company, and engaged me to take a Glass of Wormwood-wine with him, as a Whet before Dinner.

He being my very great Friend, I staid with him. Hereupon he lighted a Pipe of

Natives of *Lima* more unbelieving, or less in the Divine Favour, than the Inhabitants of *Nineveh*, who repented on the prophesying of *Jonas* against that City? Or, were they so ripe for Vengeance, that the Deity harden'd their Hearts, like that of *Pharaoh*, so that they should not regard the Warning, which he had sent them, of their Destruction, by an Evil which they were always in Fear of?

Tobacco, which he was pretty long a taking ; and not being willing to leave him before it was out, this detained me from going to Dinner to one Capt. *Ruden's*, where I was to dine ; whose House, upon the first Convulsion, sunk into the Earth, and then into the Sea, with his Wife and Family, and some who were come to dine with him. Had I been there, I had been lost. But, to return to the President, and his Pipe of Tobacco. Before that was out, I found the Ground rolling and moving under my Feet ; upon which I said, *Lord, Sir, what's that ?* He replied very composedly, being a very grave Man, *It is an Earthquake ; be not afraid, it will soon be over :* But it increased, and we heard the Church-Tower fall ; upon which we ran to save ourselves ; I quickly lost him, and made towards *Morgan's Fort*, which being a wide open Place, I thought to be there securest from the falling Houses : But as I made towards it, I saw the Earth open, and swallow up a Multitude of People, and the Sea mounting in upon us over the Fortifications.

I then laid aside all Thoughts of escaping, and resolv'd to make towards my own Lodging, there to meet Death in as good a Posture as I could. From the Place where I was, I was forced to cross, and run through two or three narrow Streets. The Houses and Walls fell on each Side of me. Some Bricks came rolling over my Shoes, but none hurt me.



When I came to my Lodging, I found there all Things in the same Order I left them; not a Picture, of which there were several fair ones in my Chamber, being out of its Place. I went to my Balcony to view the Street in which our House stood, and saw never a House down there, nor the Ground so much as crack'd. The People seeing me, cried out to me to come and pray with them. When I came into the Street, every one laid hold of my Cloaths, and embraced me, that with their Fear and Kindness I was almost stifled. I at last persuaded them to kneel down, and make a large Ring, which they did. I pray'd with them near an Hour, when I was almost spent with the Heat of the Sun, and the Exercise. They then brought me a Chair; the Earth working all the while with new Motions and Tremblings, like the Rollings of the Sea; insomuch that sometimes, when I was at Prayer, I could hardly keep myself upon my Knees.

By that Time I had been half an Hour longer with them, in setting before them their Sins and heinous Provocations, and seriously exhorting them to Repentance, there came some Merchants of the Place, who desir'd me to go on board some Ship in the Harbour, and refresh myself, telling me that they had a Boat to carry me off. I found the Sea had entirely swallow'd up the Wharf, with all the goodly Brick Houses upon it,

most of them as fine as those in *Cheapside*, and two entire Streets beyond that. From the Tops of some Houses which lay levelled with the Surface of the Water, I got first into a Canoe, and then into a Long-boat, which put me a-board a Ship called the *Siam-Merchant*. There I found the President safe, who was overjoy'd to see me, and continued there that Night, but could not sleep for the Returns of the *Earthquake*, almost every Hour, which made all the Guns in the Ship to jar and rattle.

The next Day I went from Ship to Ship to visit those that were bruised and dying; likewise to do the last Office at the sinking of several Corps which came floating from the Point. This, indeed, hath been my sorrowful Employment ever since I came aboard this Ship with Design to come for *England*; we having had nothing but Shakings of the Earth, with Thunder and Lightning, and foul Weather ever since. Besides, the People being so desperately wicked, it makes me afraid to stay in the Place; for that very Day this terrible *Earthquake* happen'd, as soon as Night came on, a Company of lewd Rogues, whom they call Privateers, fell to breaking open Warehouses, and Houses deserted, to rob and rifle their Neighbours, whilst the Earth trembled under them, and the Houses fell on some of them in the Act; and those audacious

Whores.

Whores who live still upon the Place, are as impudent and drunken as ever.

I have been twice on Shoar to pray with the bruised and dying People, and to christen Children, where I found too many drunk and swearing. I did not spare them, nor the Magistrates neither, who have suffer'd Wickedness to grow to so great a Height. I have, I bless God, to the best of my Skill and Power, discharged my Duty in this Place, which you will hear from most Persons, who come from hence, I have preached so seasonably to them, and so plain. In the last Sermon I deliver'd in the Church, I set before them, what would be the Issue of their Impenitence and Wickedness, so clearly, that they have since acknowledged, it was more like a Prophecy than a Sermon. I had, I confess, an Impulse upon me to do it; and many Times I have preached in this Pulpit, Things which I never premeditated at Home, and could not, methought, do otherwise.

The Day when all this befel us, was very clear, and afforded not the Suspicion of the least Evil; but in the Space of three Minutes, about half an Hour after Eleven in the Morning, *Port-Royal*, the fairest Town of all the *English* Plantations, the best Emporium and Mart of this Part of the World, exceeding in its Riches, plentiful of all good Things, was shaken and shatter'd to Pieces, sunk into, and cover'd, for the greater Part, by the Sea, and will,

will, in a short Time, be wholly eaten up by it; for few of those Houses which yet stand, are left whole, and every Day we hear them fall, and the Sea daily encroaches upon it. We guess, that, by the falling of the Houses, opening of the Earth, and Inundation of the Waters, there are lost about 1500 Persons, and many of good Note; of whom my good Friend, Attorney-General *Musgrove*, is one, my Lord Secretary *Reves* is another. *William Turner*, *Thomas Turner's* Brother, is lost. Mr. *Swymer* escap'd, but his House-mate, Mr. *Watts*, perish'd.

I came, as I told you, on board this Ship, in order to return Home; but the People are so importunate with me to stay, that I know not what to say to them. I must undergo great Hardships if I continue here, the Country being broke all to pieces, and dis-settled. I must live now in a Hut, eat Yams and Plantans for Bread, which I could never endure; drink Rum-punch and Water, which were never pleasing to me. I have written to send a younger Person, who may better endure the Fatigue of it than I can: But if I should leave them now, it would look very unnatural to do it in their Distress; and therefore, whatever I suffer, I would not have such a Blame lie at my Door, so that I am resolved to continue with them a Year longer. They are going, in all Haste, to build a new Town, near the Rock *Linnavea*, the  
Guardian



Guardian of this Island. The *French*, from *Pitugaveis*, or *Petitgoavias*, in *Hispaniola*, did attack this Island on the North Side; but were all defeated and destroy'd, it being about the Time of the *Earthquake*.

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*The second Letter, dated June 28.  
1692.*

EVER since that fatal Day, the most terrible that ever I saw in my Life, I have liv'd on board a Ship; for the Shakings of the Earth return every now and then. Yesterday we had a very great one, but it seems less terrible on Ship-board than on Shore; yet I have ventur'd to *Port-Royal* no less than three Times since its Desolation, among the shatter'd Houses, to bury the Dead, pray with the Sick, and christen the Children. Sunday last I preach'd among them in a Tent, the Houses which remain being so shatter'd, that I durst not venture in them. The People were overjoy'd to see me among them, and wept bitterly when I preach'd. I hope, by this terrible Judgment, God will make them reform their Lives, *for there was not a more ungodly People on the Face of the Earth.*

It is a sad Sight, to see all this Harbour, one of the fairest and goodliest I ever saw, cover'd with the dead Bodies of People of all Conditions,

Conditions, floating up and down without Burial; for our great and famous Burial-place, call'd the *Palisadoes*, was destroy'd by the *Earthquake*; which dashing to Pieces the Tombs, whereof there were Hundreds in that Place, the Sea washed the Carcasses of those, who had been buried, out of their Graves. Multitudes of rich Men are utterly ruin'd; whilst many, who were poor, by watching Opportunities, and searching the wrecked and sunk Houses, (even almost while the *Earthquake* lasted, and Terror was upon all the considerable People) have gotten great Riches.

We have had Accounts from several Parts of the Island, of the Mischiefs done by the Earthquake. From *St. Anne's* we hear of 1000 Acres of Wood-land changed into the Sea, and carrying with it whole Plantations. But no Place suffered like *Port-Royal*; where whole Streets (with Inhabitants) were swallowed up by the opening Earth, which then shutting upon them, squeezed the People to Death. And in that Manner several are buried with their Heads above Ground; only some Heads the Dogs have eaten; others are covered with Dust and Earth, by the People who yet remain in the Place, to avoid the Stench.

Thus have I told you a long and a sad Story, and God knows what worse may happen yet. The People tell me, that they hear  
great

great Bellowings and Noises in the Mountains; which makes some very apprehensive of an Eruption of Fire; if so, it will, I fear, be more destructive than the Earthquake. I am afraid to stay, and yet I know not how, in Point of Conscience, at such a Juncture as this, to quit my Station.—

Several Accounts of this desolating Earthquake were likewise transmitted to the Royal Society at *London*, from several Persons then residing at *Jamaica*; the Particulars of which are as follow: The Earth opening, swallow'd up People, and they rose in other Streets; some in the Middle of the Harbour, and yet were saved; tho' there were 2000 People lost, and 1000 Acres of Land sunk. All the Houses were thrown down throughout the Island. One *Hopkins* had his Plantation remov'd half a Mile from the Place. Of all Wells, from one Fathom to six or seven, the Water flew out at the Top with a vehement Motion. While the Houses, on one Side of the Street, were swallow'd up, on the other they were thrown in Heaps; and the Sand in the Street rose like Waves in the Sea, lifting up every Body that stood on it, and immediately dropping down into Pits; and at the same Instant a Flood of Water breaking in, rolled them over and over; some catching hold of Beams, Raftors, &c. Ships and Sloops in the Harbour were overfet and lost; the *Swan* Frigate particularly, by the Motion of

the Sea, and sinking of the Wharf, was driven over the Tops of many Houses. It was attended with a hollow rumbling Noise, like that of Thunder. In less than a Minute three Quarters of the Houses, and the Ground they stood on, with the Inhabitants, were all sunk quite under Water; and the little Part left behind, was no better than Rubbish. The Shock was so violent, that it threw People down on their Knees, or their Faces, as they were running about for Shelter. The Ground heav'd and swell'd like the rolling Sea; and several Houses, still standing, were shuffled and mov'd several Yards out of their Places. A whole Street is said to be twice as broad now as it was before; and in many Places the Earth would crack, and open, and shut quick and fast. Of which Openings two or three Hundred might be seen at a Time; in some whereof the People were swallow'd up; others, the closing Earth caught by the Middle, and pressed to Death; in others, the Heads only appear'd. The larger Openings swallow'd up Houses; and out of some would issue whole Rivers of Waters, spouted up a great Height into the Air, and threatening a Deluge to that Part the *Earthquake* spared. The Whole was attended with Stenches and offensive Smells, the Noise of falling Mountains at a Distance, &c. and the Sky, in a Minute's Time, was turn'd dull and reddish, like a glowing Oven. Yet, as great a Sufferer as

Port—



*Port-Royal* was, more Houses were left standing therein, than on the whole Island beside. Scarce a Planting-house, or Sugar-work, was left standing in all *Jamaica*. A great Part of them were swallow'd up, Houses, People, Trees, and all at one Gape; in Lieu of which afterwards appear'd great Pools of Water, which, when dried up, left nothing but Sand, without any Mark, that ever Tree, or Plant, had been thereon. Above 12 Miles from the Sea, the Earth gaped, and spouted out, with a prodigious Force, vast Quantities of Water into the Air; yet the greatest Violences were among the Mountains and Rocks; and it is a general Opinion, that the nearer the Mountains, the greater the Shake; and that the Cause thereof lay there. Most of the Rivers were stopped up for 24 Hours, by the falling of the Mountains; till swelling up, they made themselves new Tracks and Channels; taring up, in their Passage, Trees, &c. After the great Shake, those People who escaped, got on board Ships in the Harbour, where many continued above two Months; the Shakes being all that Time so violent, and coming so thick, sometimes two or three in an Hour, accompanied with frightful Noises, like a rushing Wind, or a hollow rumbling Thunder, with Brimstone Blasts, that they durst not come ashore. The Consequences of the *Earthquake* was a general Sicknes, from the noi-

some Vapours belched forth, which swept away above 3000 Persons.

As soon as the violent Shake was over, the Minister desir'd all People to join with him in Prayer; and among them were several *Jews*, who kneel'd and answer'd as the rest did; nay, the Author was told, that they were heard to call upon JESUS CHRIST; a Thing, says he, worth Observation!

The two great Mountains, at the Entrance of 16 Mile-walk, fell, and meeting, stopt the River; so that it was dry, from that Place to the Ferry, for a whole Day; and vast Quantities of Fish were taken up, greatly to the Relief of the distressed and terrified Inhabitants. At *Yellows*, a great Mountain split, and falling into the level Land, cover'd several Settlements, and destroy'd 19 white People. Had the Shake happen'd in the Night, very few would have escaped.

But the Mortality which ensued the great *Earthquake* (for they had little ones daily) made greater Havock than the *Earthquake* itself. By an Account dated the 23d of *September* following, almost half the People, who escap'd at *Port-Royal*, were since dead of a malignant Fever, from Change of Air, want of dry Houses, warm Lodging, proper Medicines, and other Conveniencies. Dr. *Morley* observes, that this Sickness (supposed to proceed from the hurtful Vapours belched from the many Openings of the Earth) spread  
all

all over *Jamaica*, and became so general that few escaped it. 'Tis thought it swept away, in many Parts of the Island, 3000 Souls; most of them from *Kingstown* only.

The same Gentleman takes Notice, That he had felt several lesser Shakes, and heard the Noise often; which was very loud, and, by those not used to hear it, might be easily taken for a rustling Wind, or hollow rumbling Thunder: But, he says, it had some puffing Blasts peculiar to itself, most like those of a Brimstone Match, when lighted, but in a much greater Degree, and such as a large Magazine of Brimstone might be supposed to make, when on Fire. He adds, that in *Port-Royal*, and many other Places all over the Island, much sulphurous combustible Matter had been found, supposed to have been thrown out, upon the Opening of the Earth; which, upon the first Touch, took Fire and burnt like a Candle.

We shall conclude the Whole with Remarks on the Weather, both before and after the *Earthquake*. Dr. *Morley* observes, that the Year 1692, began with very dry and hot Weather, which continued till *May*, when there was very blowing Weather, and much Rain till the End of the Month. From that Time till the *Earthquake* happen'd, it was excessive hot, calm, and dry. We learn, from another Hand, that the Weather was much hotter after the *Earthquake* than before; and that

that there appear'd such an innumerable Quantity of Muscatoes, as had never been seen in the Island till then.

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*An Account of an EARTHQUAKE,  
near Oxford, 1665, by Dr.  
WALLIS, and Mr. BOYLE.*

ON the 19th of *January*, 1665-6, towards Evening, at divers Places near *Oxford*, was felt a small Earthquake. At *Oxford* itself it was not perceiv'd; the Doctor says, that about that Time he was sensible of a kind of odd Shaking or Heaving in his Study, which he supposed owing to Carts or Coaches, tho' a little different from what is usual on these Occasions.

It was perceiv'd at *Bleckington*, about five Miles Northwards of *Oxford*, and also at *Boston*, *Horton*, *Stanton St. John's*, and so towards *Whately*, which is four Miles to the East of *Oxford*: It was not felt at the same Time at all these Places, but mov'd successively from *Bleckington* to *Whately*.

Mr. Boyle riding between *Oxford* and a Lodging he had four Miles from that Town, in that short Space of Time, from a settled Frost, the Wind turned, and it began to rain. Soon after his getting Home, he felt a manifest



felt Trembling in the House, which stands high in respect of *Oxford*. But he would not have taken Notice of it as an *Earthquake*, unless it had been perceiv'd by the People of the House. Soon after there happen'd a brisk Storm; on which he sent to make Enquiry at a Place call'd *Brill*, which standing higher might be suppos'd more liable to the Effects of the *Earthquake*; and he was inform'd it was very considerable there; and that a Gentleman's House in the Neighbourhood shook very much, so that the Stones in the Parlour manifestly moved to and fro. The Hill on which this *Brill* stands, is stored with mineral Substances of several Sorts. Mr. *Boyle* adds, that he has been told, that this *Earthquake* reach'd a great many Miles.

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*An Account of an EARTHQUAKE  
at Oxford, by Mr. THO. PIGOT.*

SEPT. 17th, 1683, an *Earthquake* happen'd here at *Oxford*, at a Time when such Effects are commonly experienced, if we may credit *Aristotle*, who tells us, that they are most frequently in Spring and Autumn; in which there is a greater Abundance of Vapours, and a larger Quantity of Nitre exhaled; all which Ingredients may conspire to the Production of an *Earthquake*: For if

we consider how capable they are of a large Expansion, how forcible they are when rarified in close Vessels over the Fire, we may suppose, that those Vapours, which produce such great Commotions in the Air, may cause considerable Disturbance in the Earth, when pent and lock'd up therein. The latter Part of the first Week of *September*, was so rainy, that many were apprehensive of a Deluge; the 9th of *September* there fell some very considerable Showers in the Afternoon; but from that Time it clear'd up, and to the End of the ensuing Week, it continued very warm and pleasant Weather; the 16th in the Evening was inclinable to Frost; and the next Morning it was a very hard Frost for the Season; and then, about 7 o' Clock, the Day being very clear and calm, the Earthquake happen'd. Dr. *Wallis* and Mr. *Boyle* made the like Observations of Cold preceding the Earthquake of 1665-6. The Quicksilver in the Barometer stood as high then, as at any Time for three Years before, which, together with a remarkable Calmness of the Air, a Matter generally looked upon, as one of the Circumstances which usually accompany Earthquakes, and, by many, reckoned among the Signs which precede them, may be sufficient to shew how free the Air was from Vapours at that Time; and surely, the fewer there were above, the more may be supposed below; *Ignes fatuus's* were frequently seen a  
few

few Days before this Earthquake, which, at least, may be a probable Argument to shew how full the Earth then was of Damps and Exhalations; since a Stench, that tainted Well-water in an unusual Manner, hath, upon the same Account, been generally reckon'd among the Signs of an Earthquake, and by which it may be predicted; for by this it was, that *Phercydes* is said to have presaged the Earthquake at *Lacedemon*; and *Helmout* mentions another, who pretended to the same Foresight, by tasting the Water of a very deep Well in the Castle of *Louvain*.

The Motion of this Earthquake was not of that Sort, which are termed Pulses or Succussions, such as strike the Ground, at right Angles, with a violent Shock, or intermittent Knocking, so as often to raise the Earth to a considerable Height, or force their Way by a Breach; but it appear'd rather to be such a trembling Motion, as vibrates and shakes, without altering the Position of the Earth, and leaves all Things in the same Posture in which it found them; for it shook the Earth with a tremulous and vibratory Motion, whose Reciprocations were repeated with a great deal of Quickness; the Pulses were a little discontinued, and yet they came so thick, that there was no reckoning of them, though the whole Earthquake continued scarce more than six Seconds of Time; and when it ended, the Motion of Restitution, or settling of the Building,

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ing,

ing, in which this Observer was, seemed to be with a Crash. Now, as tremulous and vibratory Motions are proper to produce Sounds, so was this Earthquake accompanied with a hollow Murmuring, like a distant Thunder; which Sound kept Time so exactly with the Motion, and was so conformable to it, in all Respects, that it plainly appears, there was the same Reason for both; to those that were within Doors it appear'd to be more considerable, and, as it were, above in the Air, occasion'd chiefly by the shaking of the Building; but those who were abroad in the Fields and open Air, perceiv'd a hollow Murmur, with a gentle Shaking towards the Surface of the Earth, not unfitly compar'd to the Groaning of some Planks of Elm, Ash, or Fir, when the Application of Fire causeth both a Trembling and a Sound. That there is a considerable Heat within the Earth, is manifest from the Experience of Miners working in the deeper Grooves; from those hot Springs which burst out thence, and from Fermentations caus'd by mineral Spirits: Nor is it less commonly observ'd, that such Heats and Fermentations within the Earth are augmented by frosty Weather; when the Streams being more pent up, do work more forcibly upon each other: And that Sounds and Tremors may be produced by such Heat, though it work only on Air, watry Vapours, or Nitre included in Pores

or



or Cavities, appears from several Experiments; as that of filling Glass Bottles half full with Water and Nitre, which, brought to the Fire, will tremble with a Sort of humming Sound, and after that break with a great deal of Noise and Violence.

The Extent of this Earthquake was but 70 Miles, or thereabouts; its largest Distance was from South-East to North-East, the least from North to South, which is a very inconsiderable Space; if compar'd with that which happen'd in the Southern Parts of *Norway*, *April* 24th, 1657, and took up 160 Miles in Length, and as many in Breadth; and *Kircher* mentions one 200 Miles in Length.

There was another Earthquake, far more considerable, which happen'd *October* the 9th, about 11 o'Clock at Night, in *Oxfordshire*; Northwards it was perceived much; it spread itself over the Mid-land Counties; and extended into *Derbyshire*; in which, as in the Coal-Countries, it was very violent.

*A Chronological Account of the  
several Burnings of Mount  
ÆTNA.*

IT has been already observed, from Dr. *Lister*, that the material Cause of Thunder, Lightning, and Earthquakes is the same.

76 *History of EARTHQUAKES.*

In order, therefore, to entertain the Reader more agreeably, we shall diversify the Subject, as Occasion offers. For this Purpose we shall give a short Chronological Account of the Eruptions of Mount *Ætna*.

To omit what is related by *Berosus*, *Orpheus*, and other less credible Authors, about the Eruptions of this Mountain, both at the Time of the Expedition of the *Ionian Colonies*, and that of the *Argonauts* into the Island of *Sicily*, which latter happen'd in the 14th Century before CHRIST; the first we shall take Notice of, is that which happen'd at the Time of the Expedition of *Æneas*, who being affrighted at the Burning of this Mountain, left that Island; of which *Virgil* gives this Description, as translated by *Trapp*.

— *And unknowing of our Course*  
*We drive upon the Cyclop's Coast: The Port*  
*Fenc'd by its Situation from the Winds,*  
*And large itself: But Ætna thunders nigh*  
*In dreadful Ruins. With a Whirlwind's Force*  
*Sometimes it throws to Heav'n a pitchy Cloud,*  
*Redden'd with Cinders, and involv'd in Smoke;*  
*And tosses Balls of Flame, and licks the Stars:*  
*Sometimes, with loud Explosion, high it hurls*  
*Vast Rocks, and Entrails from the Mountains*  
*torn;*  
*With roaring Noise flings molten Stones in Air,*  
*And boils, and bellows, from its lowest Caves.*

After

After this, in the 76th Olympiad, about 476 Years before CHRIST, we find, in *Thucydides*, another Burning, and about 50 Years after that, a third. And in the Time of the Roman Consuls, according to *Diodorus Siculus*, and *Polybius*, there happen'd four Eruptions of Mount *Ætna*. The next was in the Time of *Julius Cæsar*, and said, by *Diodorus*, to have been so fierce, that the Sea about *Liparo*, an Island near *Sicily*, by its fervent Heat, burnt the Ships, and kill'd all the Sailors therein. There was another under *Caligula*, about 40 Years after CHRIST, which was so dreadful, that it made that Emperor, who was then in *Sicily*, to fly for it. It burnt again, A. C. 814. under *Charlemagne*: And from the Year 1660 to 1669, all *Sicily* was shaken with many terrible Earthquakes; the Eruptions of *Ætna* destroy'd a vast Tract of inhabited Land round about it, and reach'd as far as *Catanea*, whose Cathedral, and the Religious in it, were destroy'd. In 1284, about the Time of the Death of *Charles K.* of *Sicily* and *Arragon*, there was another dreadful Burning. Anno 1329 to 1333, another. An. 1408, another; and 1444, another, which lasted to 1447. An. 1536, there was an Eruption which continued for a whole Year; and 1633, another, that lasted several Years. An. 1650 it burned on the East Side, and vomited such Quantities of Fire, as, according to *Kircher*, in his *Mundus Subterraneus*,

made great Devastations. And the Author; being in *Sicily*, observes, that the People of *Catanea*, digging for Pumice-Stones, found, at the Depth of 60 Foot, Streets pav'd with Marble, and many Footsteps of Antiquity; an Argument that Towns formerly stood there, though since buried in the Eruptions of that Mountain; they also found several Bridges of Pumice-Stones, probably made by the Flux of these fiery Torrents.

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*Accidents by LIGHTNING, at  
Stralsund in Pomerania.*

**J**UNE the 19th, 1670, being *Sunday*; a dreadful Flash of Lightning, like a black fiery Ball, darted thro' a large round Hole in the upper Vault of *St. Nicholas Church*, directly upon the Altar, causing such a fearful Crack, Flash and Smoke; with a sulphureous Smell, as if several Fire-balls had been thrown down and burst all at once; the Candle on the South Side of the Altar was extinguish'd by the Blow; two of the Chalicees were overthrown, the Wine spilt, and the Wafers scatter'd about, but the empty Chalice stood firm, and all three were somewhat smutted in the Foot, as likewise the Wafer-boxes towards the Bottom; and one of the Chalicees was pierced thro' in two Places, as if it had  
been



been by Hail-shot ; the Church-book was flung in the inner Passage ; the Covers of the Altar were singed in several Parts, as if it were by Powder, and somewhat burnt, and smutted here and there, as also torn in several Places ; a strong Piece of Wainscot, with a Picture in it, behind the great Altar, was split in two ; but the Brass and Iron Wires of the whole and quarter Hammers of the Church Clock were partly broken, and the rest could not be found ; and an oaken Post, fixt in the Wall for the Support of the Dial, was half torn, and, beneath the same, several Bricks were struck out of the two head Pillars, supporting the Steeple ; on the Top of the South Steeple an oaken Gutter, and a strong Beam and Supporter were shatter'd ; one of the Ministers, though sitting near the Altar to the South, had no Hurt at all ; several of the People seated near the Altar, fell down with the Fright ; on the North Side four Persons fell down ; and some that stood in, or by the Belfrey, near the Clock, were slightly hurt here and there ; and one leaning on a lined oaken Seat, had his right Arm bruised ; there issued, with great Violence, out of the South Steeple, upon opening the Windows, a great Damp like Smoak ; but there appear'd no Fire, save a little in the shatter'd Parts of the Steeple, which was soon quench'd ; the Church Dial was smutted in several Parts, so that the gilt Figures could not be discern'd, as also  
the

the gilt Weather-cocks on the Steeples, on one Side of their Tails. It was afterwards observ'd, that of the eight Persons that were hurt, one who stood in the Belfrey, had the upper Part of his Coat, as also his Shirt and Skin somewhat torn, and yet the Lining of red Frize was not touch'd; he that had his Arm bruised, had a Hole through his Coat, Waistcoat and Shirt, on the fore-part of his Body, appearing as if shot through, yet without the least Hurt; his Waistcoat of red Sarcenet kept its Colour every where, except where the Arm was hurt; and the small silver Edging was all over smutted; one Half of his Shoe was torn off, and the Sole pierced as with Hail-shot, and near a Hand's Breadth of the Foot of his Stocking was struck away, without any other Hurt either in Foot or Leg, except that, for some Days after, he had a Numbness in that Foot. One of those who sat by the Altar had his Breeches and Leather Drawers pierced thro' on each Side, as with Nail-shot, and some Parts were visibly scorched and shrunk up, as if it were by Fire, and many of these small Holes were observ'd in his Shirt, without any Hurt in his Body, save a little Pain he felt in his Foot; one Side of his Shoe was torn off, and the Sole was pierced thro' as with Hail-shot.

**HURRICANES**



the Dairy Door, it overturn'd the Milk-pails, and struck out three Panes in the Window, and in the Chambers nine Panes more; it tore off a great deal of the Roof of the Parsonage House, and rooted up a Gate-post two Foot and an half deep in the Earth; and carried it many Yards off; it blew a large Hovel of Pease from its Supporters, and set it upon the Ground, without any considerable Damage to the Thatch. About a Quarter of a Mile from the Town is a small Wood, on the Top of a Hill, which partly descends into a Vale encompassed with Hills to the North and South; so that the Wind may seem confin'd to the Vale as a Channel, before it assaulted the Town, and so be forced to spend itself only in that Glade; yet some Blasts from the ascending Wood-ground, might contribute to this Accident, because the Wind continued, as far as could be judged, as high in the Field afterwards, and the Situation of the Town did expose a far greater Part of it to this Damage than was really affected, the Valley being four or five Times the Breadth of that Part of the Town concern'd in it.

*Octob. 1670, at Braybrook in Northamptonshire, about 11 o'Clock, the Storm attacked a Pease-rick in the Field, uncover'd its Thatch, without touching another within 20 Yards of it; it blew up the End of a Barley-rick, with some Stakes in it near five Foot long, without hurting a Wheat-rick within six Yards of the*



the Barley-rick ; it afterwards uncover'd the Parsonage-house ; from whence it passed over the Town, without doing any Damage, its Situation being low ; at *Fort-bill* it uncover'd as much of a Malt-house as lay within its Extent and Breadth. *Braybrook* stands in a Valley surrounded with Hills on three Sides, at the Distance of three Quarters of a Mile ; there is a Hill called *Clackbill*, within a Mile of it, and exactly in that Point of the Compass in which the Wind then stood ; and, which is remarkable, there had been two Earthquakes in this Town within these ten Years, when the Wind, or, rather, gentle Air, then only vibrated on the Point of the Compass.

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*A remarkable Eruption of Mount  
ÆTNA, Anno 1669 ; commu-  
nicated to the ROYAL SOCIETY  
by some English Merchants.*

ABOUT 18 Days before it broke out, there was a very thick dark Sky, with Thunder and Lightning, and frequent Concussions of the Earth ; and it was observ'd, that the old Top or Mouth of Mount *Ætna*, for two or three Months before, raged more than usual, as also *Volcano* and *Strambilo*, two

burning Islands to the Westward. It first broke out on *March* 11th, 1669, about two Hours before Night, on the South-East Side of the Mountain, about 20 Miles below the old Mouth, and 10 Miles from *Catania*. At first it was reported, to advance three Miles in 24 Hours; but *April* the 5th, it scarce mov'd a Furlong a Day, and after this Manner it continued for 15 or 20 Days, passing under the Walls of *Catania*, a good Way into the Sea; but about the latter End of *April*, and Beginning of *May*, it bent all its Force against that City, and pass'd over the Walls in several Places; but its chief Fury fell on a Convent of *Benedictines*, with large Gardens between it and the Wall; after filling which Space, it met with strong Resistance from the Convent, which made it swell very high; some Parts of these Walls were driven in, whole and entire, almost a Foot. But here its Fury ceased the 4th of *May*, running afterwards in little Streams into the Sea; it had overwhelmed, in the Inland Country, about 14 Towns and Villages. The Matter of these Streams was nothing else, but divers Kinds of Metals and Minerals, liquified by the Fierceness of the Fire in the Bowels of the Earth, boiling up, like Water, at the Head of some River; and running a little Way, the Extremities began to crust or curdle, turning, when cold, into those hard porous Stones, commonly called *Sciapri*, nearly resembling

sembling large Cakes of Sea-coal, full of Fire; they came rolling and tumbling, one over another, and when they met with a Bank, would fill up and swell over, by their Weight bearing down any common Building, and burning what was combustible; its chief Motion was forward, but it would also dilate itself, like a Flood of Water in a Level, throwing out several Arms, or Tongues, as they call them. About two or three o'Clock, these Observers went up to a high Tower in *Catania*, whence they had a full View of the Mouth; a dreadful Sight, to see such a Mass or Body of Fire! They would, next Morning, have gone up to the Mouth itself, but durst not approach nearer than a Furlong, for Fear of being overwhelm'd by a sudden Turn of the Wind, which carried up, into the Air, some of that vast Pillar of Ashes, higher and bigger than *St. Paul's* Steeple; the whole Air, round about, was cover'd with the lightest of those Ashes, blown off from the Top of the Pillar; and, from the first Eruption, till it ceased, which was fifty-four Days, neither Sun nor Stars were seen. From the Outside of this Pillar, great Quantities of Stone fell off, but not very big; at the Mouth, whence the Fire and Ashes issued, there was a continual Noise, like the beating of great Waves against Rocks, or like Thunder at a Distance; it was sometimes heard 60 Miles off, and sometimes 100, to which Distance

the Ashes have also been carried ; and several Sea-men have affirm'd, that their Decks have been cover'd with them at *Zant*. About the Middle of *May*, three Quarters of the City of *Catania* were furrounded with these *Sciarri*, as high as the Top of the Walls, and in many Places they broke over ; the Surface of these *Sciarri* are ragged, lying together in great Flakes ; their Colour is of a dark dusky Blue. The whole Country, from the Walls of *Catania*, for 20 Miles, is full of these old *Sciarri*, which former Eruptions threw up, tho' the People remember none so big as the last, or that burst out so low. This Country is, notwithstanding, well cultivated and inhabited ; for Length of Time has either mollified many of those old *Sciarri*, or they are cover'd with new Mould or Ashes, tho' there still remains much Ground, which may, possibly, be never made serviceable.

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*An Account of several MINERALS  
thrown up by the Eruption of  
Mount ÆTNA.*

A Careful Examination of the Matter thrown up by Volcano's, may greatly conduce to a rational Account of these Eruptions ; for if it be found of an inflammable Nature,



Nature, it may soon be kindled by some falling Stones; which, breaking in Pieces, may strike Fire, and so inflame such combustible Materials. Upon examining the Ashes, taken up in several Places about Mount *Ætna*, some at the Top, or Mouth, some a Mile off, some four, some ten Miles, some half a Mile, and some on the Skirts of the new-made Mountain; the four first were found very dry, like Dust, but the two latter very moist; and these two differ from each other, in that one Sort consists of hard and small Lumps, the other of very soft dirty Grains, yet both moist, and of a vitriolic Taste. Upon examining the Cinders, called *Sciarri*, some were observ'd to be coarser, taken up at some Distance from the Mouth; and of these, some were black, with a Crust of Brimstone, and some of a red Hue; others were finer, said to be taken out of the Gutters of Fire, at the very Mouth; but these Sorts are light; but there is a third Sort of Stone, very solid and ponderous, which seems to consist of several Minerals melted together. The third Thing that was examined, was a Piece of Sal-armoniack, and several Pieces of Sandiver.

This Eruption was observ'd to spread three Miles in Breadth, and seventeen in Length.

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Of EARTHQUAKES in Sicily, by  
Mr. MARTIN HARTOFE.

IT seems highly probable, that these Tremblings of the Earth proceed from the same inflammable Matter, which, finding a Way, at other Times, thro' *Mongibello*, break out so furiously in Fire and Smoak. The Eruptions of these Mountains are of two Sorts; the one not so violent, as very much to disturb the adjacent Country; and this happens once in two or three Months, and lasts three or four Days; the other is more furious, and of longer Continuance, and is observ'd at *Naples* to happen to Mount *Vesuvius* once in about 80 Years; that in 1632 was so very violent, that it threw Rocks three Miles into the Air. Now, from the burning or not burning of this Hill, *Naples* concludes its Safety or Danger from Earthquakes; for, doubtless, the Matter is continually burning under the Mountain; and those vast Clouds of Smoak, which daily issue out at the Top, if the Cavity happen, by any Rock, or inward Alteration, to be stopped, must deviate thro' other Passages under Ground, heaping up there continual Magazines for a future Calamity. Now, this combustible Matter seems to be nothing else but Nitre, mixed with some other Minerals

fals and Sulphur ; for he that has seen the Method of making of Tartar by Deflagration, where an equal Quantity of pulverized Nitre is mixed, has an exact Type of these burning Hills ; for after each Spoonful that is put into the burning Crucible, there first arises a black thin Smoak, after which the fired Mineral burns up, as if it would run over the Top of the Crucible.

The Motion of the Earth is not from the Perpendicular, but Horizontal, as appears by the Cracks in the Earth, which are now to be found all over *Sicily* ; it is a Vibration so quick, that it cracks the Glass in the Windows, and the Reciprocations of a Lutestring are not more frequent than it ; now when the Vibrations are so quick, and the Body moved so large, the Motion must be prodigiously violent.

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*An Account of an EARTHQUAKE  
in Sicily, by VINCENTIUS BONAJUTUS.*

THE continual fiery Eruptions of *Ætna*, of which the first we have an Account, happen'd 500 Years before the Destruction of *Troy*, according to *Diodorus Siculus*, have been taken for the most probable Causes of the  
O horrible

horrible Shocks, that have, from Time to Time, laid waste the Island of *Sicily*.

On the 10th of *January* 1693, there happen'd an Earthquake, whose Motion was of that Sort, which *Aristotle* and *Pliny* call the first Species, and which they compare to the shaking Fit of an Ague, causing such a Motion as shakes the Earth from Side to Side. In this Shock almost all the Edifices in the Country were thrown down, of which some were very high and strong built Towers; a great Part of the City of *Catanea*, with many others, was demolish'd, and a great many Buildings in *Val di Noto*; *Syracuse* was also much shatter'd, but not ruin'd. This Earthquake was not preceded by any Darkeness in the Air, but by an agreeable, serene and warm Season; which was the more observable, as being unusual at that Time of the Year. The preceding Evening there was a great Flame or Light observ'd at about the Distance of an *Italian* Mile, and so bright, that it was taken for a real Fire made by some of the Country People; and it seem'd to the Spectators still to keep at the same Distance, tho' they went directly towards it. Whilst they were observing this Appearance, the Earthquake began, upon which the Light quite vanish'd, and the Waves of the Sea, which, before the Shock, beat gently on the Shore, began now to make a dreadful Noise. The next Day, the Air was overshadow'd with Darkeness, and  
tinged



tinged with a deep Yellow, and the darkened Sun struck the Minds of the Spectators with the melancholy Prefage of the approaching Earthquake, which was the second, and happen'd the 11th of *January*, and lasted about four Minutes; it was much like the second Sort, which *Aristotle* and *Pliny* call a Pulse or Stroke, from its Resemblance to the Beating of an Artery, and by *Possidonius*, in *Seneca*, is represented by the Name of Vibrations, it being a perpendicular Lifting up of the Earth. This Shock affected *Sicily* all over, and its Impulse was so vehement and powerful, that not only many Cities, and several Parts of the Kingdom of *Naples*, but also the Island of *Malta* shared in its Fury. It was impossible for one to keep on his Legs, and even those who lay along on the Ground, were tossed from Side to Side, as if on a rolling Billow. In open Places the Sea sunk down considerably, and in the same Proportion in the Ports and inclosed Bays, and the Water bubbled up all along the Shore. The Earth open'd in several Places in very long Clefts, some an Hand's Breadth, others half a Palm, and others like great Gulfs. From those Openings in the Valleys there issued out such a Quantity of Water as overflow'd a great Space of Ground, which, to those that went near it, had a sensible sulphureous Smell. In the Plain of *Catanea*, from one of those narrow, but very long Clefts, and about four Miles off the Sea,

the Water was thrown out altogether as Salt as that of the Sea. In the City of *Noto*, a Street, half a Mile in Length, and built of Stone, was settled into the Ground, and hung quite on one Side, like an inclining Wall; and in another Street, before the *Assent dal Durbo*, was an Opening big enough to swallow a Man and Horse. There were every where great Rocks loosen'd and thrown down from the Mountains; and in the Country of *Sortino*, a great Number perish'd in their Houses, which were beaten down by the Rocks in their rolling down the Hills. At *Syracuse*, and other Places near the Sea, the Water in many Wells, which at first were salt, became fresh, and fit to drink; the Fountain *Arethusa* was so brackish, for some Months, that its Water could not be used, but afterwards it became sweeter, and its Spring was increased to near the double. In the City of *Termini* all the running Waters were dried up, but the hot Baths were augmented by a third Part of what they were before the Earthquake. In many plain and level Places, very high Walls leaped from their Foundations above two Paces, leaving that whole Space perfectly clear and free from Rubbish, as if they had been taken up, and carried off. A Fountain, in the very Moment of the Earthquake, ejected its Waters tinged of a Blood-red for three Hours, and then it dried up, leaving many Holes in the  
Mud

Mud at Bottom, thro' which real Ashes were thrown out, and the next Day the Waters return'd of their former Quality, without the least Alteration. The South Winds blew very much, which still have been impetuous in the most sensible Earthquakes; and from the 11th of *January* to the 14th of *September* there were considerable and strong South Winds, preceded by a Noise like a Cannon at a great Distance, sometimes of a longer, and sometimes of a shorter Continuance. It has been observ'd, that in less solid Ground, such as Chalk, Sand, loose Earth, the Damage was incomparably greater than in rocky Places; its Effects on human Bodies have been various, such as Foolishness, hypocondriac, melancholic and choleric Disorders. Fevers were very common, with continual tertian and malignant Agues, accompanied with *Deliria* and Lethargies; the Small-pox made great Havock among Children; and, in short, no Age or Condition but had its Share in so universal a Calamity.

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*An Account of an EARTHQUAKE  
in the North of England, by  
Mr. THORESBY.*

THERE was an Earthquake felt at *Hull*, upon the 28th of *December* 1703, about

about three or four Minutes after five in the Evening. It heav'd up Chairs and Tables, and made Pewter Dishes and the Windows rattle, shook whole Houses, and threw down Part of a Chimney; the Shock came and went suddenly, and was attended with a Noise like Wind, though there was then a perfect Calm. It was felt in much the same Manner at *Beverly*, and other Places, and particularly at *South Dalton*; it was more violent near *Lincoln*, where it heav'd up the Chairs People sat on, &c. It was felt pretty much at *Selby*, as also near *Navenby*; the sudden Noise of which seem'd to be like the Rumbling of two or three Coaches driven furiously, and it shook the Chairs on which People sat; and even the very Stones were seen to move. A little before, there was a violent Storm; and at *Leeds* there was a much greater Storm the preceding Night, and next Day, than was in the South Parts of *England*.

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*An Eruption of FIRE near Fiorenzola; by Dr. ROB. ST. CLAIR.*

**D**R. St. Clair receiv'd an Account from his Brother, that on the Side of one of the *Appenine* Mountains, half Way betwixt *Bologna* and *Florence*, near a Place call'd *Petra mala*, about five Miles from *Fiorenzola*, there



there is a Spot of Ground about four or five Miles Diameter, which incessantly sends up a Flame rising very high, without Noise, Smoak, or Smell; yet it gives a very great Heat, and it has been observ'd to be thus at all Times, except when great Rains fell, which put it out for a Time; but when it is over, it burns with greater Heat and Vigour than before; the Sand about it, when turned up, sends forth a Flame; but within three or four Yards of it, there grows Corn all round about; for it continues always in the same Spot. The Flame seems to proceed from a Vein of *Bitumen* or *Naphtha*, that crops, as the Miners call it, only here; which when, by plowing, or some other Accident, the upper Crust has been turned up, was kindled into a Flame, by the Heat and Agitation of the Air, as other saline sulphureous Bodies are, of which Mr. Boyle's Phosphorus is a particular Instance; the like spontaneous Accension is in many mineral Substances, but none, that I know of, so quick in its Production, or so lasting, as this is; the whole Woods and Fields have been destroy'd by it; the Neighbours there have been so little curious to observe it, that they believ'd, there was a great Hole in the Place the Flame proceeded from, but the Doctor's Brother found it to be firm Ground; neither does any there remember when, or upon what Occasion it first began. The flaming Well, near *Wigan*, seems to proceed

ceed from a Cause much like this, in which you may boil an Egg, and upon the Approach of a lighted Candle, it takes Fire; both seem to proceed from a *Naptba*, or subtil *Bitumen*, only that it is in a hotter Country, and in a dryer Soil, is more subtil and inflammable; just as the *Petroleum* (Rock Oil) which is found in *Italy*, is white, like Spirit of Turpentine, and is more penetrating than the *Petroleum* which is found in more Northern Countries. An Instance of which we have in a Well two Miles distant from *Edinburgh*, call'd *Bauline Well*, of a blackish-red Colour, and very black; but being distilled, does in Colour, Taste and Smell, resemble that of *Italy*. The spontaneous Accension of the *Naptba* seems to be made out by the Smell our *Bitumen*, near *Edinburgh*, yields, being almost like Coal-smoak. There are three such Fires on the same Hills, that are extinguish'd in the Summer, but burn in the Winter; the Reason of which, the Doctor judg'd to be this, that the Bowels of the Earth being cooler in the Summer than in the Winter, do not send forth that Quantity of those subtil Exhalations, as may be sufficient to maintain a Flame in Summer; but in Winter the Bowels of the Earth being hotter, which is evident by the Smoaking of Springs in the Winter, and not in Summer, and from the Experience of Miners, when greater Plenty of Steams are sent forth, which are agitated in the Air  
into

into a Flame, the brisk Motion of the Parts, one against another, being promoted by the Subtilty and brisk Agitation of the aerial Particles, that mutually assist each other.

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*Prognosticks and Causes of HURRICANES ; by Capt. LANGFORD.*

**I**T hath been the Custom of the *English* and *French* Inhabitants of the *Caribbee* Islands, to send, about the Month of *June*, to the native *Caribbees* of *Dominico* and *St. Vincent*, to know whether there would be any Hurricanes that Year ; and about 10 or 12 Days before the Hurricane came, the Natives constantly sent them Word, and it very seldom or ever fail'd ; from one of these *Indians* the Captain had the following Prognosticks.

1. All Hurricanes come either on the Day of the Full, Change, or Quarter of the Moon:
2. If it will come on the Full Moon, you being in the Change, then observe these Signs ; that Day you will see the Skies very turbulent, the Sun more Red than at other Times, a great Calm, and the Hills clear of Clouds, or Fogs over them, which in the Highlands are seldom so ; likewise in Hollows, or Concaves of the Earth, or Wells, there will be a great Noise, as if you were in a great Storm, and at Night the Stars looking very big with

Burrs about them, and the North-west Sky very black and foul, the Sea swelling stronger than at other Times, as usually it doth in great Storms, and sometimes for an Hour or two that Day, the Wind blows very hard Westerly, out of its usual Course. On the Full Moon you have the same Signs, with a great Burr about the Moon, and many Times about the Sun; the like Signs must be taken Notice of in the Quarter Days of the Moon, in the Months of *July*, *August*, and *September*, for the Hurricanes come in those Months; the soonest the Captain heard of, was the 25th Day of *July*, and the latest was the 8th of *September*; but the usual Month they come in, is *August*.

The Benefit the Captain had of foretelling these Hurricanes, was, that whereas, heretofore, they were so dreadful, that all Ships were afraid to go to Sea, and rather chose to stay in the Roads at Anchor, than to run the Hazard of the merciless Sea, although never a Ship escap'd at Anchor, but was cast ashore many Times by the Violence of the Storm, some Vessels have been cast so far on the Shore, that when the Storm was over, they have been from 20 to 30 Yards from the Wash of the Shore, and the Vessels set whole, by which the Lives of those that were in them were saved. But the Captain finding, that if a Man keeps his Shipsailable, with good Store of Ballast, his Ports well barred and cauked,



cauked, his Top-masts down, and his Tops too, if he have Time, his Yards laced a-port, keeping the Doors and Windows of his Ship fast, she will lie as well as in other Storms; and they may, having their Ships in Readiness, stay in the Road till the Storm begins, which is always first at North, so to the North-West, till it comes round to the South-East, and then its Fury is over; so that, with the North Wind, they may run away to the South, to get themselves Sea-room for the Drift of the South-West Wind, where it blows very fiercely. By these Means the Captain, with God's Blessing, preserv'd himself in two Hurricanes at Sea, and in three on Shore; in those at Sea he did not lose a Sail, Yard, or Mast, tho' they were great Hurricanes.

The Reasons and Causes of these violent Storms, according to the Captain's Judgment, may be these. 1. It is known to all Men of Experience, that, to the Southward of the *Tropic*, there is constantly a Trade-wind, which goes about from the North to the South-East all the Year over, except where there are Reversions of Breezes, and Inlets near the Land; so that when this Hurricane, or rather Whirlwind, comes in Opposition to the constant Trade-wind, then it pours down with that Force and Violence, that it exceeds all Storms of Wind in the World; for it takes Trees away by the Roots, and those that are extraordinary strong rooted,

it twists off in the Middle. In a Hurricane at *Nevis*, the Captain saw a high Mountain that was all green with Trees, left in most Places bare, and the Wood lying in such a Condition, with half Trees, or Stumps, or Quarters, that one would think it almost incredible. 2. It is remark'd by all Men, that have been in those Parts where the Sun comes to the *Zenith*, that at its Approach towards it, there is always fair Weather; but at his Return to the Southwards, it generally occasions, off the North Parts of the *Equinoctial*, much Rain and Storms, as *Tornado's*, and the like, which makes the Wind in the *Tornado's* come on several Points; but before it comes, it calms the constant easterly Winds, and when they are past, the easterly Wind gathers Force again, and then the Weather clears up fair. 3. The Wind being generally towards the *Tropics* easterly, unless at such Times as before declar'd, meeting with the Opposition of these Hurricanes, which come in a contrary Course to that Trade-wind, causes the violent Whirlwind, upon the Sun's leaving the *Zenith* of *Barbadoes* and the adjacent Islands, by which the easterly Wind doth lose much of its Strength, and then the West Wind, which is kept back by the Power of the Sun, pours down, with the greater Violence and Force, upon those Parts where it gets Vent; and it's usual, in sailing from *Barbadoes*, or the Islands thereabouts, to the North, for a westerly Wind, when

when they begin to lose the easterly Wind, to have it calm, as is usual before Hurricanes ; and then the Wind springing up, till it comes to be well settled, causes the Weather to be various ; but after the settled westerly Wind comes fresh, they have been constantly without those Shufflings from Point to Point.

Here it is be observ'd, that all Hurricanes begin from the North to the Westward, and on those Points that the easterly Wind blows violently, the Hurricane blows most fiercely against it ; for from the N. N. E. to the E. S. E. the easterly Wind blows freshest ; so doth the W. N. W. to the S. S. W. in the Hurricane blow most violent ; and when it comes back to the S. E. which is the common Course of the Trade-wind, then its Violence ceases, and so breaks up. And thus the Captain took the Cause of the Hurricanes to be the Sun's leaving the *Zenith* of those Parts towards the South ; and secondly, the Reverse or rebounding back of the Wind, which is occasion'd by the calming of the Trade-wind, to proceed from the same Cause.

But it will be objected, why should not this Storm be all over the *West-Indies*, as well as *Barbadoes* and the *Leeward Islands* ? To which the Captain answers, that it had, in about 25 Years of his Experience, taken its Course from *Burmudas*, or the *Summer Islands* to the *Caribbee Islands*, but seldom or never doth it reach so far, as from the Latitude of 16 to 32 Degrees,

grees, which are the Latitudes of one and the other Place ; but it has been observed, that when Hurricanes have been in *Martinico*, which is within two Degrees of Latitude, and two Degrees of Longitude, according to the Miles of that Circle, yet no Hurricane hath been at *Barbadoes*. Again, it has been observed, that Hurricanes have done the like to the Northwards ; for when the Hurricane hath been at *Antegoa* and *St. Christopher's*, those Ships that were in the Latitude of 20 Degrees, had no Hurricane, but constant westerly Winds, reasonably fair, and then there were no Hurricanes in *Bermudas* ; and when the Hurricanes were at *Bermudas*, the *Leeward* or *Caribbee* Islands had none ; nor had those Islands the Hurricane when *Barbadoes* had it.

It may be farther objected, why the Hurricane was never known to go farther to the Westward than *Porto-Rico*, which lies in or near the Latitude of those Islands of *St. Christopher's*. To this he answers, that from *Porto-Rico* downwards, that both that, as well as *Hispaniola*, and other adjacent Islands, are of vast Greatness, and have very high Lands, that of themselves give Reversal, or westerly Winds, at Night, thro' the Year ; for there, for these Reasons aforesaid, the easterly Wind, toward Night, doth calm, those Lands afford a Land-wind, which the other Islands cannot do, by Reason of the Smallness of those *Caribbee* Islands, but very near the Shore, the Trade-



Trade-wind has its full Force, till this general Whirlwind comes, for the Reasons aforesaid. He imagines likewise, to the Southwards of *Barbadoes*, where the *Tornado's* come frequently, there are no Hurricanes; nor was there any at *Barbadoes* when these *Tornado's* commonly came there, which made some small Reversal, though it was but for two or three Hours; yet the easterly Wind, giving some Way, by the Sun's declining to the *Zenith*, prevents this furious Reverse, where it hath no Vent, till it was forced by the Violence of the two Winds.

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WATER-SPOUTS *in the* Mediterranean; *by* Dr. STUART.

AS the Bowels of the Earth contain Abundance of sulphurous and combustible Materials, which, by their Junction and Coalition, cause vast Explosions and Earthquakes; so the Regions of the Air are no less pregnant with the same Kind of ignitive and sulphurous Matter, and produce as astonishing Effects. In the last Section we gave an Account of the prodigious Power of the Wind when raised into a Hurricane; in this we shall entertain the Reader with another extraordinary *Phenomenon* in Nature, generated in the Air,

Air, and very surprizing to the Spectator ; I mean, *Water-Spouts*.

Dr. *Stuart* being, on the 27th of *August* 1701, upon the Coast of *Barbary*, to the Northward of the Town of *Bona* ; upwards of 10 Leagues at Sea, about 7 o' Clock at Night, soon after Sun-set ; there appear'd in the N. E. which was directly up the Gulf of *Lyons*, great and continual Flashes of Lightning, one after another, hardly without Intermision ; and thus it continued till next Morning without Thunder, the Flashes of Lightning sometimes resembled the sudden Appearance of a Star, at other Times, of a flaming Sword, and again, of a Silver Cord, stretch'd along the Clouds, or the irregular Cracks of a Phial from Top to Bottom. About Eight next Morning they had Thunder, with a Continuation of Lightning, such as above-mention'd, all from the N. E. or thereabouts. About Nine the same Morning, there fell from the Clouds, which look'd dismally black, louring, and, as it were, heavy with Rain, in the said N. E. Quarter, three *Water-Spouts* ; that in the Middle, seem'd as big as the Mast of a Ship, and the Doctor judg'd it to be distant, at least, a League and an Half ; the other two were one Half so big ; all of them were black, like the Cloud from which they fell, and smooth, without any Irregularity, only that, at first falling, some fell perpendicularly, others obliquely, and all of them were smaller

smaller at the lower than at the upper End, representing a Sword ; sometimes also one of them would bend, and become streight again, and sometimes become narrower, and again increase its Bulk ; sometimes it would disappear, and immediately fall down again ; at other Times it would be extenuated to the smallness of a Rope, and again become large as before. There was also a great boiling up of the Sea, as in a *Jette d'eaux*, or Water-work ; and this rising of the Water had the Appearance of a Chimney smoaking in a calm Day ; some Yards above the Surface of the Sea, the Water stood like a Pillar ; and this spreading itself, it was dissipated like Smoak ; and the Sword-like Spout from the Clouds, either came down to the very Middle of this Pillar, as if it had been join'd to it, as the largest Pillar, which fell perpendicularly down, always did from the Beginning to the End ; or else pointed to this Column of Water, at some Distance, either in a perpendicular, or oblique Line, as did the other two lesser ones. There were three or four Spouts more, which appear'd at the same Time in the same Quarter of the Heavens, but not like the three former, either in Bulk or Duration. Those last appear'd and disappear'd several Times, during the Continuance of those three aforesaid. It was hardly distinguishable, whether the Sword-like Spout first fell down from the Cloud, or whether the Pillar of Water first

rose from the Sea ; both appearing opposite to each other all of a sudden ; only the Doctor observ'd of one of them, that the Water boil'd up from the Sea to a great Height, without the least Appearance of a Spout pointing thereto, either perpendicularly or obliquely ; and here the Water of the Sea never came together in the Form of a Pillar, but rose up in a spreading Manner, the Sea boiling round the Place ; the Wind being then N. E. the said Boiling advanced towards the S. W. as a sitting or moving Bush upon the Surface of the Sea, and at last it ceased. This shews that the boiling, or flying up of the Water of the Sea, may begin before the Spout from the Cloud appears ; and, indeed, if there is any small Matter of Priority betwixt these two Appearances, the boiling or throwing up of the Sea has it ; which first begins to boil, and then forms itself into a Pillar of Water, especially on the lower Part thereof. It was observable of all of them, but chiefly of the large Pillar, that, towards the Extremity, it appear'd like a hollow Canal, only black in the Borders, but white in the Middle ; and tho' at first it was altogether black and opaque, yet one could distinctly perceive the Sea-water flying up along the Middle of this Canal, as Smoak does up a Chimney ; and that with very great Swiftnefs, and a very perceptible Motion ; and then, soon after, the Spout, or Canal, broke in the Middle, and disappear'd  
by



by little and little; the boiling up, and the Pillar-like Form of the Sea-water, continuing always the last, even for some considerable Time after the Spout disappear'd, and, perhaps, till the Spout appear'd again, which it commonly did in the same Place, as before, bursting and forming again several Times in a Quarter, or Half an Hour.

The Doctor supposes, that this Phænomenon may be solv'd by Suction, or rather Pulsion, as in the Application of a Cupping-glass to the Flesh, after the Air is exhausted by the kindled Flax. It was further observable, that the oblique Spouts always pointed from the Wind; that is, when the Wind was at N. E. the oblique Spouts always pointed to the S. W. tho' at the same Time there were others perpendicular, which still continued so, notwithstanding the Wind; as also, that such as were curved, had still the convex Side from the Wind, and the concave Side towards it; that is, the Wind being at N. E. the Concave was towards the N. E. and the Convex towards the S. W. It rain'd a great deal during the Continuance of these Spouts, and after their total disappearing, there was Half an Hour's violent Storm from the N. E. with very little Rain; and after that the Weather clear'd up.

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*A WATER-SPOUT at Hatfield in  
Yorkshire ; by Mr. ABRAHAM  
DE LA PRYME.*

ON the 15th of *August* 1684, about Two o'Clock in the Afternoon, there appear'd a *Water-Spout* in the Air at *Hatfield* in *Yorkshire* ; it was about a Mile off, coming directly towards the Place where Mr. *De la Pryme* was. The Season was very dry, the Weather extremely hot, the Air very cloudy, the Wind aloft, and pretty strong ; and what was remarkable, it blew out of several Quarters at the same Time, and fill'd the Air thereabouts with very thick black Clouds, in different Layers. This blowing of the Wind soon caus'd a great Vortex, Gyration, and Whirling among the Clouds, the Center of which, every now and then, dropt down, in the Shape of a thick, long, black Tube, commonly call'd a Spout ; in which was plainly perceivable a Motion like that of a Screw, continually drawing and screwing upwards, as it were, whatever it touch'd. In its Progress it mov'd slowly over a Hedge-row and Grove of young Trees, which it caus'd to bend, like Hasei Winds, in a circular Motion ; then advancing forwards to a large  
Barn,

Barn, it twitch'd off, in a Minute, all the Thatch, and fill'd the whole Air therewith; and coming to a very large Oak, it made it bend like the aforesaid Trees, and broke off one of the strongest and largest Branches, and twisting it about, flung it to a considerable Distance off; then coming within 300 Yards of him, Mr. *De la Pryme* beheld this extraordinary Phænomenon, and found that it proceeded from a Gyration of the Clouds, by the meeting of contrary Winds in a Point or Center; and where the greatest Condensation or Gravitation was, falling down into a large Pipe or Tube, something like the *Cochlea Archimedis*; and in its whirling Motion, it either sucks up Water, or destroys Ships, &c. Having gone about a Quarter of a Mile farther, it was dissolv'd by the Prevalency of the Wind, which was easterly.

Mr. *De la Pryme* likewise gives an Account of another Water-Spout that happen'd at *Hatfield*. He says, though the Weather, in *June*, had been, in this Part of the Country, exceeding wet and cool, yet *Monday*, the 21<sup>st</sup> of the said Month, was pretty warm, and about two o' Clock that Afternoon, no Wind stirring below, tho' it was somewhat stormy up higher in the Air, the Clouds began to be mightily agitated and driven together; whereupon they began to be very black, and were very visibly hurried round, from whence there proceeded a most audible whirling Noise. Some

Time

Time after, there descended a long Tube, or Water-Spout, from the Center of the congregated Clouds, wherein there was a swift spiral Motion, like that of a Screw, or the *Cochlea Archimedis*, when in Motion. It proceeded slowly from W. to N. E. broke down a large Oak, and frighten'd the Labourers out of the Field, and made others lie flat upon their Faces, to escape being whirled about, and killed, as they saw had happen'd to several Jackdaws, that were suddenly snatch'd up, carried out of Sight, and then thrown a great Way off. At length it pass'd over the Town of *Hatfield*, filling the whole Air with the Thatch it took off from some of the Houses; then touching upon the Corner of the Church, it tore up several Sheets of Lead, and rolled them together in a strange Manner; and soon after it dissolv'd and vanish'd, without doing any further Mischief. There was nothing more extraordinary in this Water-Spout, than in that which we have just given an Account of; and by all the Observations which Mr. *De la Pryme* could make of both, he found, that had they been at Sea, and join'd to the Surface thereof, they would have carried up a vast Quantity of Water into the Clouds; and then the Tubes would have become much more strong and opaque than they were, and have continued much longer.

It is commonly said, that at Sea the Water collects; and bubbles up a Foot or two high  
under



under the Spouts before they join : But this is a Mistake, owing to the Pellucidity and Fineness of those Tubes, which, undoubtedly, touch the Surface of the Sea, before any considerable Motion can be produced therein ; and that when the Tube begins to fill with Water, it then becomes opaque and visible. As for the Reason of their dissolving of themselves, after that they have suck'd up a great Quantity of Water, Mr. *De la Pryme* supposes to be owing to the great Quantity carried up, which must needs thicken the Clouds, impede their Motion, and, by this Means, dissolve the Tubes.

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*An Account of the Eruption of a  
BURNING SPRING, at Broseley,  
in Shropshire, by Mr. HOPTON.*

ABOUT June 1711, at *Broseley*, near *Wenlock* in *Shropshire*, (about two Nights after a remarkable Day of Thunder) there was heard a terrible Noise in the Night, which awaked several People ; who coming to a boggy Place under a little Hill, about 200 Yards off the River *Severn*, perceiv'd a mighty Rumbling and Shaking in the Earth, and a little Boiling of the Water thro' the Grass ; upon digging up some Part of the Earth, the  
Water

Water flew up immediately to a considerable Height, and was set on Fire by a lighted Candle. To prevent the Spring being destroy'd, an Iron Cistern was placed round it, with a Cover upon it, to be lock'd down, and a Hole in the Middle, thro' which one might see the Water. If you put a lighted Candle, or any Thing of Fire, to this Hole, the Water immediately takes Fire, and burns like Spirits of Wine, and continues so to do as long as you keep the Air from it; but by taking up the Cover of the Cistern, it quickly goes out: The Heat of this Fire much exceeds that of any other Fire Mr. *Hopton* ever saw, and seems to have more than ordinary Fierceness in it. Some People, after they have set the Water on Fire, have put a Kettle of Water over the Cistern, in which green Pease, or a Joint of Meat, are much sooner boil'd, than over any artificial Fire; if green Boughs, or any other Thing that will burn, be put upon it, it presently consumes them to Ashes. The Water of itself is as cold as any other Water Mr. *Hopton* ever felt; and what is remarkable, as soon as ever the Fire is out, if you put your Hands into it, it feels as cold as if there had been no such Thing as Fire near it.

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*An Account of the Eruption of  
Mount VESUVIUS, in 1707, by  
S. VALETTA.*

THE Eruptions of this Mountain are so frequent and continual, that they are almost innumerable; so that there does not pass a Month, much less a Year, wherein it does not break out with more or less Violence, and do more or less Damage. The greatest Eruption that hath happen'd, for some Time, was that in 1707, when, in the Height of Summer, in the latter End of July, Mount *Vesuvius*, that had been quiet for some Time, began to shew some Signs of an Eruption: For, at first, those internal Bellowings were heard, which resounded in the very Center of the Mountain, yet without any Smoak or Flame; then it began, by Degrees, to emit Smoak and clear Fire, which, especially in the Night-time, illuminated all *Campania*. In the mean Time, at different Intervals, it made such a terrible Noise, that the Reports of our largest Guns are scarce to be compar'd therewith. Then it began to roll its Ashes for several Days and Nights, carrying them aloft every Way into the Air, and dispersing them into different Quarters, according

cording as the Wind happen'd to blow ;  
 sometimes into the Sea, at other Times, into  
 the adjacent Territories of *Stabia*, *Nola*, and  
*Acerra* ; and, what was very remarkable, a  
 prodigious Shower of Stones, that destroy'd  
 both Men and Cattle ; after this it began to  
 belch out, at its gaping Mouth, a liquid  
 Torrent of Bitumen, call'd *Glarea*, or Grit ;  
 which, at first, appear'd like a gentle Stream  
 of Fire, descending with the same slowness of  
 Motion, as is observable in melted Pitch, or  
 the like viscid Substances. This Matter, which  
 resembled molten Glass, as it cool'd in its  
 Progress, became as hard as Stones. It was  
 observable, that the superior Surface of this  
 Matter, as it cool'd, was converted into small  
 spongy Stones, but its lower Surface, into a  
 broad, hard, solid Flint, (long used in paving  
 the Highways) as if what lay next the Air  
 had admitted and retain'd some of its Parti-  
 cles, while its lower Part became a solid, com-  
 pact Mass, without any Vacuities. More-  
 over, there were two that had not been ob-  
 serv'd for several Ages before ; for, about  
 the third or fourth Day, it began to emit, at  
 its Mouth, Flashes of Lightning, almost like  
 those sometimes observ'd in the Air, but of  
 a Serpentine Form ; and, withal, very loud  
 Claps of Thunder were heard, so thick and  
 frequent, that, at first, it was thought it would  
 rain, till it was perceiv'd they proceeded from  
 the Mountain, and that the dark Clouds did  
 not



not consist of Vapours, but of large Quantities of Ashes. In the mean Time, on the 2d of *August*, at four in the Afternoon, there was such a thick Cloud of Ashes hovering over *Naples*, as intercepted the Rays of the Sun; and the Darknefs was so great, that the People could not distinguish, in the very Streets, their Neighbours and Friends; in a Word, no Midnight Darknefs exceeded it; if any adventured Abroad with Torches, they were obliged to return Home again; which only happen'd once before, in the Emperor *Titus's* Time, according to *Xiphilis*: So that every Place was fill'd with the Shrieks of Women; but the more Prudent betook themselves to Prayer to Almighty God, and with Apprehensions expected the Event of such a Prodigy. Both the Magistracy and Clergy appointed Supplications to be made, and to carry in Procession to the *Capuan* Gate, which regards the Mountain, the Relict of St. *Januarius*, the tutelar Saint of this City; whither when they were come amidst the palpable Darknefs of the Day, at last, about the first or second Hour of the Night, towards the North, where, perhaps, there was not so great a Quantity of Ashes, a Star or two were seen, and the azure Face of the Heavens began to appear, and afterwards the Darknefs that had obscured the Day, gradually to diminish in the Night; and the Ashes, by the shifting of the Wind, to be driven into the Sea. The following Day con-

tinued somewhat dark, by Reason of the Remains of the Ashes dispersed in the Air. *Vesuvius*, having thus covered the Fields with Ashes, and belched out its Grit for several Days, so that its black Torrent had almost reached the neighbouring Sea, at length, in about 15 Days, it was seen to cease. Upon this the *Neapolitans*, to perpetuate the Memory of *Januarius*, whom they always found propitious to them in their Calamities, struck a Medal of Gold and Silver, with *Januarius's* Head on one Side, and this Legend,

DIVO JANUARIO LIBERATORI URBIS  
FUNDATORI QUIETIS.

In *English* thus :

*To St. Januarius, the Deliverer of our City,  
the Founder of our Quiet.*

And on the Reverse, Mount *Vesuvius*, with this Inscription,

POSTQUAM COLLAPSI CINERES ET FLAM-  
MA QUIEVIT CIVES NEAP. INCOLUMES.  
A. MDCCVII.

In *English* thus :

*After the Ashes were fallen, and the Flame  
had ceased, the Citizens of Naples were  
safe. In the Year 1707.*

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*An Account of a STORM of RAIN,  
that fell at Denbeigh in Wales.*

UPON *Tuesday* the 16th of *July* 1706, about Eight o'Clock in the Morning, it began to rain in and about *Denbeigh*, and continued incessantly for 30 Hours, but not very violently till about three or four o'Clock on *Wednesday* Morning, when it rain'd somewhat faster, attended with a terrible Noise, like Thunder, with some Flashes of Lightning, and a boisterous Wind. About Break of Day, the Wind and Rain began gradually to abate every Hour, till one or two o'Clock in the Afternoon, and then it perfectly ceas'd, and the Air became clear, and somewhat calm. On *Tuesday* the Wind blew S.W. but on *Wednesday* it was come to the N. W. The Effects of this great Storm were dismal; for it caus'd the over-flowing of all the Rivers in *Denbighshire*, *Flintshire*, and *Merionethshire*, &c. which spoil'd a great deal of Corn, and carried off all the Hay that was mow'd down near the Banks of the Rivers, in such vast Quantities, that it choak'd the Arches and Inlets of the Bridges, and broke down a Dozen large ones: Oaks, and other large Trees, were rooted up, and swept away, with several Quickset Hedges, and some Quillets, by the Side of the River

River *Elwy*, were so cover'd with Stones and Gravel, that the Owners could not well tell, whereabouts their Hedges and Land-marks stood. And this River alter'd its Channel; and two or three Rivulets, that convey'd Water to some Mills, were choak'd up with Stones and Gravel. It was affirm'd by several People, that the great Floods were not so much the Effects of Rain, as the breaking out of a vast Number of Springs in such Places as they were never known to flow from before. In the Town of *Denbigh* a great many broke out in Houses and Stables, especially in that Part next the Castle, on the North Side; and some of them with a great deal of Violence, and in such Quantities, that it was averred by several Men of the Town, that three of these new Springs, which flow'd out of the *Bull*, *Cross-keys*, and *Boar's-head*, were sufficient to turn any Corn-mill. At a small Distance Northward of *Denbeigh*, lies *Park-snoding*, a rocky Hill, where there broke out a great many Springs, which flow'd so plentifully for nine or ten Days, that the Cattle were watered in them for all that Time; whereas, before and after, the People were oblig'd to water them, all Summer long, at a Well in the Highway, at some Distance from *Park-snoding*. There were several deep Holes and Trenches cut in the Highways, adjoining the River *Elwy*, &c. and some of them very large; which was not attributed so much to the  
the



the overflowing of the River, as to the breaking out of Springs in those very Places. In Comb Mountain there was a Pit of a circular Form, which, in the Summer-time, was wont to have little or no Water in it, and in the Winter as much Water as would swell the Surface to about 14 or 16 Yards; but now, in the Middle of Summer, it rose up, at least, a Yard and a half higher than it was ever known to have done in the wettest Winters; and, overflowing its Banks, it fell down the Hill with such Violence, as to penetrate into the very Body of a rocky Road, and dug large Pits into it, so that this common Highway was become irreparable.

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*An Account of the strange Effects  
of THUNDER and LIGHTNING;  
by SAMUEL MOLYNEUX, Esq;*

MRS. Close gave Mr. Molyneux the following Account of the Thunder and Lightning, which happen'd at her House, at Newforge, in the County of Down, in Ireland, on the 9th of August 1707. She observ'd, that the whole Day was close, hot, and sultry, with little or no Wind stirring, till towards the Evening; that there was a small Breeze, with some mising Rain, that lasted

about an Hour ; that as the Air became darkened after Sun-set, she saw several faint Flashes of Lightning, and heard some Thunder-claps, as at a Distance ; that between 10 and 11 at Night, both were very violent and terrible, and so increased, and came on more frequent, till a little before 12 o' Clock ; that a Flash of Lightning, and a Clap of Thunder, came both at the same Time, louder, and more dreadful than all the rest, which, as she thought, shook and-inflam'd the whole House, and then perceiving a very strong sulphureous Smell in her Chamber, and feeling a gross Powder falling thick on her Hands and Face, as she lay a-bed, she concluded, that Part of her House was either beaten down by the Thunder, or set on Fire by the Lightning ; that getting up, and calling for a Candle, she found her Bed-chamber full of Smoke and Dust, as also the Kitchen that was beneath it ; that then she only observ'd the Looking-glass, which hung in her Chamber, to be broken ; but that, next Day, she found Part of the Top or Cornice of the Chimney, that stood without the Gabel-end of the House, where her Chamber was, had been struck off ; that Part of the Coping of the Splay of the Gavel-end itself was broken down, and 12 or 16 Shingles of the Roof adjoining thereto, raised or ruffled, but none shatter'd or carried away ; that Part of the Cieling in her Chamber, beneath those Shingles, was forced down, and  
Part

Part of the Plaister and pinning Stones of the adjoining Wall broken off and loosen'd, and the whole Breach 16 or 20 Inches broad; that, at this Place, there was left on the Wall a smutted Scar or Trace, as if blacken'd by the Smoak of a Candle, which pointed downwards, towards another Place on the same Wall, whereon a Breach was made, like the former, and of the same Dimensions, part of which was behind the Place where the Looking-glass hung; that the Boards on the Back of a large hair Trunk, full of Linen, standing beneath the Looking-glass, were forced in and splinter'd, as by the Blow of a Smith's Sledge; that two Thirds of the Linen in this Trunk were pierced or cut through, the Cut appearing of a quadrangular Figure, and between two or three Inches over; that one Side of the Trunk was forced out, as the Back was drove in; that about two Foot Distance from the End of the Trunk (where the Floor and Side-wall of the House joined) there was a small Breach made in the Plaister, and a small Chink, or Crevice, to be seen, so wide that a Man might thrust his Fingers down; and that, just beneath this, in the Kitchen, the Cieling was forced down, and some of the Lime or Plaister of the Wall broken off; that exactly under this there stood a large Tub, or wooden Vessel, inclosed with a Crib of Brick, or Lime, which was broken, or splinter'd all to pieces, and most of the  
S or

or Lime-work it scatter'd about the Kitchen. The Looking-glass was broken with that Violence, that there was not a Piece to be found of the Bigness of Half a Crown ; that several Pieces of it were sticking, like Hail-shot, in the Chamber-door, which was of Oak, as also on the other Side of the Room ; that several of the Edges and Corners of some of the Pieces of the broken Glass were ting'd of a light flame Colour, as if heated in the Fire ; the Curtains of the Bed were cut into several Pieces, which was supposed to be done by the Pieces of Glass ; that several Pieces of Muslin and Linen, left on a Trunk, were thrown about the Room, no way singed or scorched ; and yet the Hair on the Back of the Trunk, where the Breach was made, was singed ; that the uppermost Part of the Linen, within the Trunk, was not touched, and the lowermost Parcel, consisting of upwards of 350 Folds of Linen, was pierced through, of which none was any way smutted, but the uppermost Fold of a Table-cloth that lay over all the rest ; that there was a yellow Singe or Stain perceivable on some Part of the damag'd Linen, and that the whole smelt strong of Sulphur ; that the Glass of two Windows in the Bed-chamber above, and two Windows in the Kitchen below, was shatter'd in such a Manner, as that scarcely one whole Pane was left in any of them ; that the Pewter, Brass, and Iron Furniture in the Kitchen, were thrown  
down,



down, and scatter'd about, particularly a large Gridiron of 20 Pound Weight, that hung upon an Iron Hook, near the Cieling, was found lying on the Floor; that a Cat was found dead, next Morning, in the Kitchen, with its Legs extended in a moving Posture, and with no other Sign of Hurt, than that the Fur was sing'd a little above the setting on of the Tail. It was farther observable, that on the Wall, both above and below a little Window, a Mark was to be seen, as if it had been the Blow of a Smith's Sledge, or large Iron Crow, whereby a Splinter of the Stone, weighing some Pounds, was broken off. Mr. *Molyneux* was farther inform'd, that from the Time of that great Thunder-clap, both the Thunder and Lightning diminish'd gradually, so that, in an Hour's Time, all was still and quiet again.

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*An Account of a New Island, raised near Sant-Erini, in the Archipelago; by Dr. WILLIAM SHERARD.*

**D**R. *Sherard* had an Account of this *New Island*, from the *English* Consul at *Milo*, as follows, viz. That on the 12th of *May* 1707, N. S. an Island began to rise up, a

Musket-shot from the Island of *Sant-Erini*, which continually increasing, from Day to Day, in the same Manner, and troubling the Sea, there rose up several Rocks, that fixed themselves to this Island; so that, on *June* the 11th, it was about Half a Mile in Circumference.

From the *Paris Gazette*, *April* 14th, 1708, they write from the Island of *Sant-Erini*, in the *Archipelago*, about 28 Leagues North from the Town of *Candia*, of the 1st of *December* last, that there sprung up an Island from the Bottom of the Sea (which is very deep at that Place) formed of Stones, cast up by a Volcano, which has often produced the same Effects, and after the same Manner. In the Year 726, in the Time of the Emperor *Leo Isauricus*, an Island was formed on the North Side, called the *Burnt Island*, by Matter thrown up, and heaped together by the Volcano. In 1427, in the Month of *December*, this *Burnt Island* was increased by Rocks cast up by subterraneous Fires. In 1650, in the Month of *September*, the Volcano again took Fire, and produced the same Effects, without forming any Island, only a Shelve or Bank 10 Fathoms under Water. Lastly, in the Month of *November* 1707, the Volcano made an Island, which is already two Miles in Circumference, which still increases by Rocks, and other new Matter that is thrown up. This Burning was perceived,

as

as at all other Times, by violent Earthquakes, followed by a thick Smoke that rose out of the Sea in the Day-time, and Flames in the Night, and accompanied with a terrible Roaring under Ground. There is no Instance of the Effects of any Volcano at Land, like those in the Sea ; and yet what renders them the more credible, is, that the Island of *Sant-Erini* itself, is almost all of it composed of burnt Rocks and Pumice Stones ; it produces some Sorts of Grain, but has neither Rivers nor Springs, nor any other Water, but what is preserved in Cisterns.

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*A further and more particular  
Account of the New Island,  
thrown up near Sant-Erini ; by  
F. BOURGUIGNON.*

ON Monday the 23d of May 1707, O. S. at Sun-rising, we observed, between the two *Burnt Islands*, commonly called the *Great* and *Little Kammeni*, a floating Rock, as it were ; which, at first, we took to be some Vessel Ship-wreck'd on that Coast, and seem'd as if it would, in a little Time, be dash'd to Pieces against the *Lesser Kammeni*, that was hard by ; on which Account some Mariners put out immediately to Sea, in order to view it.

it. Soon after we were surprized to hear, by them, that it was a Shoal beginning to spring up from the Bottom of the Sea, and was not yet plainly to be discerned. Next Day, several Persons went, out of Curiosity, to satisfy themselves; some of them went ashore on this new Shoal, which was still moving, and sensibly increased under their Feet. They carried from thence several Curiosities, and, among others, a Kind of Oysters, very large, and of an exquisite Taste, which they found sticking to the Rock, and raised out of the Water, as the Shoal had increased in Height; particularly, F. Bourguignon observed a Sort of Stone, that, at first Sight, looked much like Bisket, but, in Reality, was no other than a very fine Pumice Stone, surpassing all he ever saw in *France*, or any other Parts of *Europe*.

Two Days before the springing up of this Shoal; viz. on the 21st, between Twelve and One o'Clock at Noon, there was an Earthquake felt over all the Island, which could not reasonably be ascribed to any other Cause, than the rising up of this Mass of Rock. From its first Appearance, to the 13th or 14th of *June*, it continually increased very sensibly, as well in Bigness as in Height, without any Noise or Disturbance. This Shoal was very pleasant to look on, being of a white Colour and round Figure; the Soil that composed it was light, with a small Mixture of Clay.



Clay. This *New Island*, according to the Report of some learned and skilful Persons, that were upon it the Beginning of *June*, was Half a Mile in Circumference, and from 20 to 25 Foot high; for five or six Days it did not increase so sensibly as before; insomuch, that most People were persuaded it had entirely ceased, and so were free from farther Apprehensions; yet, afterwards, the Sea, already much agitated by the raising up of this Mass of Earth, appear'd more troubled every Day than other, not so much by reason of this Shoal being remov'd, and still floating, as on Account of the Mixture of a vast Quantity of different Matters continually thrown up, Night and Day, from the Bottom of the Sea, so that a Person might easily distinguish several Sorts of Minerals, by the Diversity of the Colour they produced on the Surface of the Water; but Sulphur was the greatest Quantity, insomuch that the Sea about *Sant-Erini*, was tinged with it, for near 20 Miles Distance; the excessive rolling of the Waves, about the new Shoal, was greater than ever, and a more than ordinary Heat was sensible to any one that approached too near; which, undoubtedly, was the Cause of such Quantities of Fish being found dead on the Shore. Every Body felt a horrible Stench, that infected the neighbouring Air, and which, at more than three Miles Distance, was often found of dangerous Consequence; the Boiling

ing of the Water, instead of decreasing, grew every Day considerably greater; this struck every Body with fresh Apprehensions, which were farther increased, when on *Friday, July* the 10th, at Sun-set, they perceived, between this Island and the *Lesser Kammeni*, a Chain of black Rocks, as it were, that rose up from a prodigious Depth of the Sea, to the Number of 17 or 18, not very distinct from each other, and join themselves to this *New Island*, as they actually did some few Days after. Next Day, being *Saturday*, they were seen very plainly; and those whose Tops could only be seen the Night before, now appeared exceeding large. On *Saturday* the Smoak was first observed to break forth, much resembling, in Thickness and Colour, that of a burning Furnace, and at the same Time were heard certain Murmurings under Ground, which seemed to proceed from the Center of this *New Island*, as yet no deeper in the Sea, to be plainly distinguished; the Rocks above mentioned united together, and seemed already to form another Island, distinct from the former; the Smoak appeared more plentiful, and the Fire, at last, began to break forth about the 19th of *July*. It was small at first, and of a dull Colour; afterwards it increased by Degrees, as the Island increased and broke out more and more, and in different Places. It was no less frightful and surprising, than curious to the sight, to see,  
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every Night, on the Top of this Mount, that Nature had lately formed a vast Number of burning Furnaces, as it were, all of a bright Flame, in Order and Position not unlike those Illuminations of the *Minarets*, which the *Turks* usually make at certain Times of the Year.

One Night, at the latter End of *July*, about an Hour after Sun-set, there appeared, of a sudden, in the middle Region of the Sky, a fiery Lance, seeming to come from East to West; but it disappearing again too soon, its Dimensions could not be exactly observed. In the mean Time the *Burnt Island* increased prodigiously, and extended itself, chiefly on the South and North Sides; the Sea also seemed much more disturbed, and was loaded with Sulphur and Vitriol; the Boiling of the Sea was more fierce and violent, the Smoak became thicker, and in greater Abundance, and the Fire larger, and more frightful. But, above all, a Stench, which infected the whole Country, became so intolerable, that Persons of the strongest Constitutions could hardly breathe in it; others that were weaker, fell into frequent Faintings, and almost every Body was seized with Vomiting. It was, sometimes, more in one Place than in another, and more or less tolerable, as the Wind set. This Stench was very prejudicial, spoiling of the Vines, and a great Smoak, that rose out of the Midst of this Island, joining itself to a thick Fog, that commonly hangs over *Sant-*

*Erini*, when the Wind is at South, burnt and destroy'd, in the Beginning of *August*, in less than three Hours Time, all the Fruit that was ripe, and ready to be gather'd in; especially in such Vineyards as lay most exposed to the South.

In 13 or 14 Days Time, there was a considerable Alteration in these two new Islands; the white Island, that did not seem to increase any more, was now grown considerably higher, and the black Island was become much longer; both of them, tho' different in Colour, were now united together, and formed but one Island, as they remain at this Time. The Fire and Smoak had made new Vent-holes, and the Noises under Ground were more frequent and audible; and, from the Midst of the Island, Peals were heard, as of so many large Cannon discharged, and, at the same Instant, a large Quantity of burning Stones was seen thrown into the Air. These furious Discharges made the Doors and Windows, and sometimes the best built Houses, shake; and, more than once, *F. Bourguignon* saw Stones all on Fire, darted into the Air out of Sight, and afterwards fall like a Bomb, and be quenched in the Sea, at more than five Miles Distance. When these Discharges happen'd, which were as loud as those of a Cannon, commonly a great Flash of Fire, like Lightning, immediately ensued; and, after that, there sprung up, very swiftly, a black  
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and dismal Smoak, mixed with Ashes, and so prodigiously thick, that, when spread in the Air, it formed a thick Cloud of several Colours; which, by Degrees, dissolving into a fine Dust, fell, like Rain, on all the neighbouring Country, and more particularly, *Sant-Erini*, where it was so plentiful, that the Ground was often cover'd therewith. The Noise grew stronger, and was louder than if six or seven Cannon had been discharg'd at once; the Fire made itself, every Day, more Vent-holes, and became more dreadful. Every Night Nature represented a great Variety of Scenes, as the Fire broke forth in different Forms; sometimes burning Ashes spread themselves in the Air, like a Plume of Feathers, which falling again upon the Shoal, made it appear all of a light Fire. At other Times one would take it to be the actual discharging of so many Mortar-pieces, which shot entire Rocks, like so many Bombs, capable of destroying the largest Ships; though, for the most part, these Stones were of a middle Size, yet in such Quantities, that he often saw this little Island all cover'd with them, and pleasantly illuminated therewith.

These dreadful Discharges were less frequent at the latter End of *August*, but increased in *September*, and happen'd daily in *October*, and afterwards became almost incessant. It is true, the Noise was not so loud, nor the Stones cast up so large, nor in such Quanti-

ties; the Boiling and Agitation of the Water was much abated; the Sea began to recover its former Colour; the Stench that was before insupportable, was very little for six Weeks; yet the Smoak grew every Day thicker, blacker, and in greater Abundance; the Fire was greater than ever, and seemed sometimes to strike the very Sky; the subterraneous Noise was become continual, and so violent, that it could not be distinguish'd from Thunder. In a Word, this New Island grew every Day more curious, more dreadful, and less accessible, and was so far from ceasing to increase, at the Approach of Winter, that it was seen continually increasing on the South-west Side, where Nature seemed as if she laboured to make a large Port for Ships; and on the 20th of *November* it appeared to be, at least, three Miles in Circumference, and 40 Foot high.

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*The Account of the 'foregoing New raised Island continued; with many surprizing Particulars relating thereto, not before mentioned; by F. GOREE.*

**W**E should not dwell so long upon the Description of this *New raised Island*, but that it explains and illustrates the principal

pal Subject of this Treatise, *Earthquakes*, and shews the true Cause of these terrible Convulsions of Nature.

Among the Prodigies of Nature, says F. *Goree*, we may justly reckon an Island which arose from the Bottom of the Sea, in the Bay that forms the Harbour of *Sant-Erini* in the *Archipelago*; especially if we consider the Situation, Manner, and all the other Circumstances of the Formation of this *New Island*: For, what can be more surprizing, than to see Fire not only break out of the Bowels of the Earth, but also make itself a Passage through the Waters of the Sea, without being extinguish'd? Or, what can be more extraordinary, or foreign to our common Notions of Things, than to see the Bottom of the Sea rise up into a Mountain above the Water, and become so firm an Island, as to be able to resist the Violence of the greatest Storms? And tho' subterraneous Fires, when pent in a narrow Passage, may raise up a Mass of Earth, as big as an Island; yet, that this should be done in so regular a Manner, that the Water of the Sea cannot any Ways penetrate into, nor extinguish them; that the Fire itself, after having made so many Vent-holes and Passages, should, notwithstanding, retain a Force sufficient to raise up so large a Mass; and, in fine, that after the Fire is extinct, this Mass should not fall, nor sink down again by its own Gravity, but still retain the same Height  
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the Fire had raised it to : This is what seems, to *F. Goree*, more surprizing than any Thing that has been related of Mount *Gibel*, *Vesuvius*, or any other Volcano.

Yet this is not the first Time that these Prodigies have been seen at *Sant-Erini* : For if it be not true, that this Island itself, which was antiently called *Tbera*, was, in like Manner, raised out of the Sea (as *Pliny* assures us it was) it is, at least, most certain, that three other small Islands (two of which lie within the Bay of *Sant-Erini*, and the third a little without it) have been formed, and raised up above the Sea by subterraneous Fires. The first of these Islands, which was antiently called *Hiera*, because it was, as is supposed, dedicated to *Pluto*, is now called *Megali Kammeni*, that is, *the great Burnt Island*. *Justin*, L. 30. C. 4. speaking of the first War of the *Romans* with the *Macedonians*, and of the two Months Truce, which *Philip* King of *Macedon*, and Father of *Perses*, then demanded, and which he obtain'd, according to *Salianus*, the 4th Year of the 145th Olympiad, and the 196th before the Birth of our LORD, tells us, that this Island rose up from the Bottom of the Sea, this very Year, after an Earthquake. It became as big again in the Year of our LORD 726, by the joining of another Island thereto ; which, according to *Theophanes*, a *Greek* Author, also rose out of the Sea, and raised itself exactly to the same Height with the  
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the Island *Hiera*, and united so well to it, that, at this Time, there remains no other Mark of its joining, than only a Cleft or Fissure, which reaches from one End of the Island to the other, and in several Places is not Half a Foot broad. The same Thing happen'd a second Time in the Year 1457, as appears by a *Latin* Inscription on a Marble at *Sant-Erini*, but with this Difference, that the subterraneous Fire, after being raised to the Height of five or six Foot above the Water, a vast Quantity of Rocks, which formed a Space about a Mile in Circumference, open'd a Passage for the Sea-water to enter, whereby it was extinguish'd; and the Middle of that Space remained so low, that the Sea flowing into it by a subterraneous Canal, formed there a small Lake, which continues to this Day. As to the second Island, which is a little without the Bay, and called, in *Greek*, *Alpronisi*, or the *White Island*, because the Earth with which it is cover'd, is White, like Lime. *Pliny*, who lived in the Time of the Emperor *Vespasian*, says, that it rose out of the Sea, and appear'd in his Time. The third Island, which is the least, and called, by the *Greeks*, *Mikri Kammeni*, or the *lesser Burnt Island*, was formed in the Year 1573, according to the Account of several old People, who had learned it of their Ancestors; and it is between this Island, and the *Great Kammeni*, that, on the 23d of *May*,  
N. S.

N. S. in the Year 1707, at Break of Day another new Island was first discover'd.

Five Days before it appeared, *viz.* on the 18th of *May*, between 1 and 2 o'Clock in the Afternoon, there was an Earthquake at *Sant-Erini*, which was not violent, and continued but a Moment; and in the Night, between the 22d and 23d, there was another, which was still less sensible than the former. It is natural to suppose, that the new Island then first began to move, and raise itself from the Bottom of the Sea; yet if we consider, that these two Earthquakes were not violent, and lasted but a Moment; that the Sea was, in this Place, from 80 to 100 Fathoms deep, it seems difficult to believe, that in five Days Time it could rise to this Height. What inclines *F. Gorcee* to think the contrary, is, that its Height, then above the Surface of the Sea, and which it did not arrive to in less than three Years Time, was much less than that from the Bottom of the Sea to the Surface of the Water. Add to this, that a long Time before these Earthquakes, the Fishermen perceived a Stench every Time they passed by that Place, which shews, that the Island had then begun to move; yet it is very certain, that there were not any other Earthquakes at *Sant-Erini* than those, which, 14 or 15 Years before, continued for several Days, and were very violent.

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However it was, some Seamen discover'd this Island very early in the Morning; but not being able to distinguish what it was, went immediately to it, but return'd as hastily back again, and spread the Report over the Island; which was the more readily credited, because all the Inhabitants knew, and several had, themselves, seen, what happen'd in the Year 1650. There was then a new Island, like this, which rose up between the Islands of *Sant-Erini*, *Nio*, and *Andro*, by Means of subterraneous Fires, which caused several violent Earthquakes, accompanied with a roaring Noise under Ground, sulphureous Exhalations, an unsupportable Stench, and black Smoak, which rose out of the Sea with Flames to the Height of 10 or 12 Cubits; the Sea was then tossed backward and forward, in such a Manner, by the terrible Shocks of the Earth, that it overflow'd and destroy'd 30,000 Perches of Land in *Sant-Erini*; and the Air was so infected with Exhalations from the Fire, that 25 Persons, and a great many Beasts were stifled. At length, when this Island had not above 8 or 10 Fathoms of Water to rise, so as to appear above the Surface of the Sea, the Force of the subterraneous Fire was so violent, as to open a Passage before its Time; whereby the Water of the Sea, entering in like a Torrent, extinguish'd the Fire, and this Mass of Earth and Stones did not rise any higher.

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How great soever the Apprehensions of the Inhabitants of *Sant-Erini* were at the first Sight of this new Island, yet, a few Days after, not seeing any Appearance either of Fire or Smoak, some of them took a Resolution to go and view its Situation, which they did accordingly, and went on Shore upon it. They passed from one Rock to another, on which they met with several remarkable Curiosities; and, among the rest, a Sort of white Stone, that cut like Bread, and resembled it so well, in Form, Colour, and Consistence, that, were it not for its Taste, any one would take it for real Bread. There was also a great Quantity of fresh Oysters, which they found sticking to the Rocks. While they were busy about this, they perceiv'd the Island move and shake under their Feet; in short, the Rising of the Island was visible to the Eye, and it increased not only in Height, but also in Length and Breadth; tho' it was already between 15 and 20 Foot high above the Sea, it could not yet be seen from the Mountain *Merovigli*, or the Castle of *Scaro*, which stands upon the Shore, by reason the *Lesser Kammeni* lay between, and hinder'd the Sight; but 15 Days after, they began to see it from *Merovigli*, and in a few Days after that, from the Castle of *Scaro*, situated upon another Mountain; whence we may judge how much this new Island grew in a few Days.

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As the Motion, by which this Island increased every Day in Height, was sometimes equal, and at other Times unequal, in respect to all the Parts of so large a Mass, so it did not always rise equally on every Side. It often happen'd, that while it grew in Height and Length on one Side, it sunk down and decreased on the other. One Day F. Goree saw a Rock rise out of the Sea, at 40 or 50 Paces distant from the Island, which he continued to observe for some Days together; at the End of which it sunk again into the Sea, and did not appear any more; but this was different from what happen'd to some others, which having disappear'd as this did, reappear'd again some Time after.

The *Lesser Kammeni*, which lies very near, was often shaken with the Motion which raised this new Island; from a small Cleft, observed on the Top of the little Island, sometimes Stones would break loose, which rolling down its Sides into the Sea, would raise a Cloud of Dust like Smoak. At this Time the Sea, or Gulph, or Bay of *Sant-Erini*, chang'd its Colour several Times. At first it appear'd green, afterwards reddish, and some Time after of a yellowish Colour, with a Stench, which, spreading itself over a great Part of *Sant-Erini*, gave Reason to think, that this Colour was only owing to the Sulphur, with which the Sea was cover'd. The Smoak appear'd first on the 16th of *July*, at which

Time, from a Place in the Sea, where they assured F. *Goree* they could never find any Bottom, and which was upwards of 60 Paces distant from the new Island (which they then called the *White Island*) there arose a Ridge of black Stones, which the *Greeks*, by Reason of their Hardness, call'd *Sideropetres*, or Iron Stones, forming another Island, called by the Inhabitants, the *Black Island*, and which was afterwards not only the Center of the Island, but also of the Fire, Smoak, and great Noise that was heard some Time after. The Smoak that issued out of this Ridge of Rocks, or *Black Island*, was very thick and white, as if it had proceeded from five or six Lime-kilns joined together, and being carried by a North Wind towards the Castle of *Acrotiri*, it went into the Houses of the Inhabitants, but without causing any great Annoyance, because it had no very great Stench. Four Days after the Smoak had thus appear'd, they saw, in the Night-time, Fire issuing out of the same Place.

The Inhabitants of *Sant-Erini*, especially those of the Castle of *Scaro*, began to be apprehensive, having Fire and Smoak continually before their Eyes; yet the Fire was then but very little, not being above the Breadth of the Mouth of a Furnace, and did not appear in the Day-time, only in the Night from Sun-setting to Sun-rising; and was so far from spreading the whole Length of the Ridge  
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of Stones above-mentioned, that it possessed but a small Part of it, which was always, after that, the common Passage for the Smoak and Fire.

As to the first, or *White Island*, neither Fire nor Smoak were to be seen, yet it continued to grow larger; but the *Black Island* increased much faster. Huge Rocks were daily seen to rise on each Side of it, which made it sometimes longer, and at other Times broader, and, by their Height, could be very nearly judg'd the Number of Feet it rose every Day or Night. Sometimes these Rocks joined themselves to the Island, and at other Times they were at a Distance from it; so that, in less than a Month, there were four little *Black Islands*, which, in a few Days after, united together, and seem'd but one Island.

As the Smoak increased very much, and there was no Wind stirring, it rose up to the Middle Region of the Air, so as to be seen at *Candia*, *Naxos*, and other Islands, and in the Night-time it appear'd all of a Flame 15 or 20 Foot high; the Sea, at that Time, was cover'd with a Matter, or Froth, which in some Places was reddish, and in others yellowish, from whence there proceeded such a Stench over the whole Island of *Sant-Erini*, that, for Fear of being infected, several Persons were oblig'd to burn Incense, and others to make Fires on the Tops of their Houses, to disperse it, and purify the Air; but it did  
not

not continue above a Day and a half; for a strong South Wind arose, which, together with the Motion of the Sea, did indeed disperse this frothy Matter, but occasion'd, otherwise, great Damage to the best Part of the Island of *Sant-Erini*. At that Time they were in great Hopes of having a very plentiful Vintage, when this Wind carried all the Smoak upon their Vineyards, which burnt them up in such a Manner, that the Grapes, which were not yet ripe, became, in a Night's Time, like dried Raisins; so that, afterwards, they were oblig'd to throw them away, because of their Sourness. Nor was this the only Effect occasion'd by this thick Smoak; for, it is farther remarkable, that Silver and Copper were thereby turned black; and tho' some People, who were oblig'd to pass thro' the Smoak, in going to their Houses, assured F. Goree, that it had no very bad Stench, yet several of them were, that, and the next Day after, troubled with great Pains in their Heads.

At this Time the *White Island*, which seem'd to be above the *Lesser Kammeni*, and could be seen, from the first Floor of the Houses in the Castle of *Scaro*, sunk down so low, that it could not be seen from the second.

Hitherto the Sea had not been observ'd to boil up, nor was there any Noise heard upon the *Black Island*; but on the 31st of *July*, the Sea was seen to emit Smoak at two several Places, one of which was about 30, and the other



other upwards of 60 Paces from the Island. In these two Places, both of which were perfectly round, the Water of the Sea look'd like Oil, and seem'd to rise and bubble, which it continued to do for more than a Month; in which Time there were a great many Fish found dead on the Shore, by their happening to have been too near these two Places. The following Night there was heard a dull hollow Noise, much like that of several Cannons fired at a Distance; and at the same Time there was seen to rise out of the Middle of the Funnel, Flames of Fire, which darted very high into the Air, and disappear'd immediately. Next Day there were several Repetitions of the same Noise, follow'd by a Smoak, not white as usual; and which, notwithstanding a fresh North Wind, rose up, in a Moment, to a prodigious Height, in Form of a Column; and would, in the Night-time, in all Probability, have appear'd, as if it were all on Fire.

*August 7th*, the Noise alter'd, and from being dull, as before, became very loud, and resembled that made by several large Stones thrown all together into a very deep Well; and *Goree* supposes, that this Noise was occasion'd by several huge Pieces of Rock, which, after having been rais'd up with the Island by the Violence of the Fire, broke off by their Weight, and fell back again into the subterraneous Caverns. What confirmed him in

this Opinion, was, that he saw, at that Time, the Ends of this Island in so great Commotion, that after appearing for some Days, they then disappear'd, and, after that, re-appear'd again. However it was, this Noise, after having continued for near a Month, was succeeded by another, much louder, and more extraordinary; it so nearly resembled Thunder, that when it really thunder'd, as it did three or four Times, there was very little Difference between the one and the other.

As the Passage which the Fire had made itself, by its Violence, thro' so many Rocks, was not, probably, in a streight Line, and in some Places narrower, and in others larger, and more free; so it is probable, that the Fire, or, rather, the sulphureous and burning Exhalations, caused this great Noise, by turning from one Side to the other in these winding Caverns, and endeavouring to get a Passage out, which was difficult for them to find. And this is the Reason why the Noise of this subterraneous Thunder was sometimes not so loud, and why, a little after, it grew more violent, and sometimes so stunning, that People could not hear each other speak; and why the *Black Island*, which was already very high, seemed to crack on every Side; and, in short, why the imprisoned Fire, after several Windings and Turnings, having collected all its Force, was enabled to break out with a Noise,

Noise, equal to that of several Cannons discharged at once.

*August 21st*, the Smoak diminish'd considerably, as also the Fire, none appearing in the Night-time; but next Day both returned with greater Violence than any Time before. The Smoak was reddish, and very thick, and the Fire so great, that the Water of the Sea smoaked, and bubbled up around the *Black Island*. In the Night *F. Goree* view'd, with a Telescope, the great Fire that appear'd upon the Mountain of this Island, and he reckon'd 60 Openings, or Funnels, divided from each other by Rocks, all which emitted a very bright Flame. Probably there were others, and perhaps as many on the other Side of the Mountain, which he could not see. Next Morning he observ'd, that the Island had been very much rais'd in the Night-time; that a Range of Rocks, above 50 Foot long, had rose out of the Water, which made the Island broader than it was before; and that the Sea was almost cover'd over with the reddish frothy Mass above-mention'd. This Matter, or Froth, appear'd on the Sea every Time that the Island increas'd, and occasion'd a Stench, much like that of the Sink of a Ship; which may be suppos'd to arise from a slimy Earth, mixed with Sulphur, which being rais'd up with the Rocks, and coming to be washed off by the Waves, was loosened, and diluted by

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the Water, and so sent up to the Surface, the Salts with which it was impregnated.

Hitherto the Fire had only appear'd in one Place, on the Top of the *Black Island*; but on the 5th of *September* it made itself another Passage, and appear'd at the Extremity of that Island, on the Side next *Terasia*, another Island, that some Authors affirm to have been formerly joined to that of *Sant-Erini*, and separated therefrom by an Earthquake. The Fire did not continue at this End but a few Days, which decreased at the Place from whence it commonly used to issue out; and here we were agreeably surprized to see the Fire dart out three several Times from this Place without any Noise, and rise up in the Air like a large Rocket; the following Days there was much the same Appearance; for the subterraneous Thunder, after having made a great Noise, broke out, from Time to Time, with a Clap as loud as that of a Cannon, and was accompanied with a very beautiful and large Flame, which, shooting up in an Instant, to a great Height, fell down on the Island again, illuminating it almost all over. The Figure it made in the Air, resembled very much a certain artificial Firework, in *French* called the *Gerbe*; but yet with this Difference, that the former rose much higher, and much larger, but not so distinct as that of the *Gerbe*. Immediately after, there appear'd, in the Air,



a Blaze, in the Shape of a long fiery Sword, which continued some Time, without moving, over the Castle of *Scaro*, and afterwards disappear'd. At that Time also, the *White* and *Black Islands*, having increased in Length, in Proportion as they rose in Height, united together; and the End of the *Black Island*, towards the North-East, did not increase any more, either in Height or Length, whilst that towards the West increas'd very sensibly to the Sight; which made F. *Goree* imagine, that the Mine of Sulphur being at this Place, and the Fire not finding any Passage out here, had Force to raise up this Part, and not the other; for in the Middle of the Island it always found Openings to issue out at, together with the Smoak; where it then had four Passages, so near each other, that one could not well distinguish them but by the Smoak, not that which commonly issued out, and was continual, but that which rose up at some certain Times with great Force: For this Smoak came out sometimes at one Passage, and sometimes at another, and oftentimes out of the whole four together; sometimes with a great Noise, and sometimes with no Noise at all, tho' then it also issued out with the same impetuous Fire. There likewise came out of these Passages a whirling Noise, like that of an Organ Pipe with a Variety of Sounds. One would think, that the Noise of this Thunder should not then be so loud, by reason of the several Pas-

sages above-mentioned ; yet notwithstanding it was not at any Time so great, and so frequent, as it was then, and as it was upwards of six Months after, when it was like the Report of a Cannon ; and not a Day or Night passed, but 5 or 6, sometimes 10 or 12 of them were heard, and at the same Time several large burning Stones were thrown into the Air ; some of which falling on the *Great Kammeni*, set Fire to some Thickets, and others were cast upwards of a Mile into the Sea. These Claps were always attended with the Smoak already mention'd, very different from that which continually issued out from the Gulph of Fire almost in the Middle of the Island ; for this latter was much thicker and blacker, and rose, in an Instant, much higher, and was not dispersed till some Time after, and then fell in Ashes upon the Country, or into the Sea ; some of which the Wind sometimes carried as far as *Anacuphi*, an Island about 25 Miles distant from the Bay of *Sant-Erini*. Some of these Ashes, which were of a Colour between Black and White, were put into the Fire, imagining they would have burnt like Gun-powder, which they very much resembled, but they produced no other Effect, than making a small hissing Noise.

*September* 18th, two Hours after Midnight, there was felt an Earthquake at *Sant-Erini*, though the subterraneous Fire had had a free Passage for so long a Time ; it did not do  
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any Damage, and had no other Effect than enlarging the Island very much, and removing, for some Days, the Fire and Smoak into other Places, thro' new Vents it made itself, increasing both of them very considerably. And, indeed, F. *Goree* never saw so much Fire, nor heard such terrible Claps, as after this Earthquake; by the Violence of these Claps, Houses were shaken at upwards of three Miles Distance; and out of the Middle of a great Smoak, which rose up, and appear'd like a Mountain, one might see and hear huge Pieces of Rock fall down into the Sea, and upon the Island, thrown out with the same Violence and Noise, as a Bullet out of the Mouth of a Cannon. The *Lesser Kammeni* was, several Times, cover'd over with large Stones, crusted over with burning Sulphur; several of which rolling afterwards from the Top of this little Island into the Sea, made a very bright Light, and afforded a pleasant Prospect in the Night. At first F. *Goree* thought, that the Fire had passed under Ground from the new Island to this, because they are not far asunder; but he soon found his Error, and that the Fire proceeded only from these Stones sulphur'd over; for the Sulphur with which they were crusted over, being consumed, they were all extinguished in Half a Quarter of an Hour, except some few that continued shining upwards of Half an Hour. One Day, when the *Lesser Kammeni*,

*Kammeni* was all on Fire, after one of these furious Claps, and the Air was so likewise, thro' the frequent Flashes of Fire that appeared in the Clouds; three Flashes were seen to come out of the Places where the Fire was, which one could not distinguish from real Lightning, but that they were formed lower, and at the two Ends of the Island; by the Violence of one of these Claps, Part of the Top of the new Island was carried off into the Sea, and several Stones thrown upwards of two Miles; and, as if the Mine had been exhausted by this great Clap, three or four Days passed without any Noise, and almost without any Fire or Smoak. But the Fire soon kindled again, and the Island became more terrible than before. *F. Goree* was then at a Village six Miles off, where (notwithstanding it lay under a Mountain) the Explosion of the Mine was distinctly heard; the Castle of *Scaro* suffer'd so violent a Shock, that the Doors and Windows that were shut, were open'd by the Force of the Clap.

*February* 10th, 1708, at Half an Hour after Eight in the Morning, there was another Earthquake at *Sant-Erini*, and some Persons assured, that there had been another the Night before, but not so sensible as this; and the Volcano was so far from being exhausted, that it acquired new Force by other Veins of Sulphur, which took Fire at a greater Distance, as appeared from the Fire and Flames, which  
arose



arose so frequently into the Air, and fell again over the Island, affording in the Night-time as fine a Sight as any artificial Fire-works. Besides this, several large Rocks joining to the Island, which before were even with the Water, were now raised much higher; and the Noise, Smoak, and Boiling of the Sea increased much; the subterraneous Noise was more violent than ever, and continued several Days together without any Intermission; and in a Quarter of an Hour the Mine discharg'd itself five or six Times; the Noise of which, with the large Quantity of Stones it threw into the Air, the Shocks it gave the Houses, and the Fire which appear'd in open Day-light, (which was never seen before) very much surpass'd all that had hitherto happen'd.

The 25th of *April*, was the most remarkable, both for the great Number, and Violence of the Claps; by one of which near 100 large Stones were thrown up, all at once, into the Air, which fell again, at about two Miles Distance, into the Sea. Tho' F. *Goree* was then about three Miles off from the new Island, he observed a Stone of a surprizing Bigness, which did not rise so high as the rest, but was driven farther, in a streight Line, like a Cannon Ball.

From the 15th of *April* to the 23d of *May*, (which was a Year from the Production of this Island) nothing in particular was observed

ed, only that the Island increased in Height, and not in Length; and that one furious Clap beat down, at once, all its Top, which, by the Ashes, and Stones of all Sizes, that fell upon it both Day and Night, became much higher than it was before. After this, every Thing began to abate, the Smoak decreased, the subterraneous Noise was not so violent, and the Claps, tho' very frequent, were not, however, so loud, because the Funnels, which gave Vent to the Fire and Smoak, were then much larger than they were before.

Hitherto F. Gorce had view'd this Island only at a Distance; but, seeing then that there was no Danger, he went with F. Crispo, the *Latin* Bishop of *Sant-Erini*; and going directly to it, they were oblig'd to pass over a Place, where the Sea smoak'd very much, but did not bubble; where they were no sooner come, than they perceiv'd a Heat strike upon their Faces, which was no other than the Fumes of the Sulphur. Upon putting their Hands into the Water, they felt it very hot. They were then 500 Paces from the new Island; from whence they went directly over to that Part of the Island, where it had increas'd in Length; but seeing the Smoak was very thick, which shew'd there was a great Fire all thereabouts, they did not think it safe to go any nearer, and so satisfied themselves with only viewing the Space that was between this new Island and the *Lesser Kamineni*, thro' the

the narrowest Part of which they judged a Galley might pass. After this, they went ashore on the *Great Kammeni*, from thence to view the whole burning Island nearer, and without Danger, especially that Side of it which was scarcely seen from the Castle of *Scaro*. From hence it was, that after having examin'd every Particular, they judged this new Island to be about 200 Yards in Height, five Miles in Circumference, and a Mile over at its broadest Part; as to its Form, it is oblong, and resembles, in some Measure, the Figure of a Dragon. After having tarried some Time upon the *Great Kammeni*, (where they often saw, at no great Distance, a great many Stones thrown violently out of the Gulph of Fire, and fall down again, with a terrible Noise upon the Island) they resolv'd to coast it round, and go to the other End of it, where the Island had not increas'd for several Months, and where there did not appear any Fire or Smoak. They were within 100 Paces of it, when putting their Hands into the Water, they perceiv'd it warm, and that the farther they went, the hotter it grew. At this Instant the Mine discharg'd itself, and the Wind drove upon them the thick Smoak, which broke out with great Violence every Time the Mine took Fire, and a Shower of Ashes and small Stones, no bigger than little Hail-stones, falling upon them, they were oblig'd to quit their Design; and letting down

a Plummet, they had, at this Place, 95 Fathoms of Water, without finding the Bottom, the Line not being long enough. Afterwards viewing the Space at this End, between the Island and the *Lesser Kammeni*, they found, in several Places, that it was narrower at this Side, than at the other; and that if the new Island should continue to grow bigger, several Rocks, which were already half above the Water, and rose up nearer to the *Lesser Kammeni*, would, in Time, shut up the Passage, and join both Islands together, so as to make a little Port between them, which would be very commodious for the Shipping of *Sant-Erini*. Afterwards returning to the Castle of *Searo*, they passed by the little Port of the *Lesser Kammeni*, and notwithstanding its Nearness, the Inhabitants could not hear any of the Noise that this new Island made, which was owing to its Height.

During the rest of the Time that F. *Goree* tarried at *Sant-Erini*, to the 15th of *August* 1708, (at which Time he came away) the Smoak, Fire, Noise, &c. continued much the same as has been now describ'd, that is, always pretty moderate. From his leaving *Sant-Erini* to the 6th of *July* 1711: F. *Goree* receiv'd several Letters, and saw and spoke with several Persons that came from thence; and they all told him, that the new Island still grew in Length, on that Side next *Terasia*; that then it was about six Miles in Circumference;



rence; that as to the Fire, and Noise under Ground, they were more moderate than before. F. *Goree* considering, that the Passages which give Vent to the Fire are very large, and almost in the Middle of the Island; and that there is no Appearance, that the Fire will ever make a Passage at the Bottom of the Sea, so as to let the Water in, to extinguish it, supposes, that this Phenomenon will not have an End, till the Mine of Sulphur be entirely consum'd.

*An Account of a surprizing FALL  
of WATER, from a Spout on  
the Moors of Lancashire, by Dr.  
RICHARDSON.*

**D**R. *Richardson* gives the following Account of a remarkable *Spout of Water*, that fell on *Emott-Moor*, near the *Coln* in *Lancashire*, on the 3d of *June* 1711, about 10 o'Clock in the Morning; when several Persons, who were employ'd near the Place where this Accident happen'd, on a sudden were so terrified with an unusual Noise in the Air, that they left their Work, and ran Home, which was about a Mile from the Place; but, to their great Surprise, they were intercepted by Water; for a small Brook in the Way was

risen, upwards of six Feet perpendicular, in a few Minutes of Time, and had overflow'd the Bridge.

It was observ'd, that there was no Rain, at that Time, on *Emott-Moor*, only a Mist, which is very frequent upon those Mountains in Summer-time. There was a great Darkeness in the Place where the Water fell, without either Thunder or Lightning, as the Doctor was inform'd by an Eye-witness. The Meadows at *Wiccolae* were overflown so much, that the like had not been observ'd in several Years before, though there it was a very bright Day.

The Doctor went to view the Place, and found that the Ground was torn up to the very Rock where the Water fell, which was upwards of seven Foot deep, and a deep Gulph which was form'd for about Half a Mile, and vast Heaps of Earth cast up on each Side of it; some Piles still remaining upwards of 20 Foot over, and six or seven Foot thick. About ten Acres of Ground were destroy'd by this Flood. The first Breach where the Water fell, was about 60 Foot over, and no Appearance of any Eruption, the Ground being firm about it, and no Cavity appearing. It is to be observ'd, that the Ground on each Side the Gulph was shaken in such a Manner, that large Chasms appear'd at upwards of 30 Foot Distance.

*Observations*

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*Observations on the ERUPTIONS  
of Mount VESUVIUS ; by Mr.  
BERKELEY.*

**A**PRIL 17th, 1717, Mr. Berkeley, with much Difficulty, reach'd the Top of Mount *Vesuvius*, in which he observ'd a vast Aperture, full of Smoak, which hinder'd his seeing its Depth and Figure. He heard, within that horrid Gulph, certain odd Sounds, which seem'd to proceed from the Belly of the Mountain, as also a murmuring, fighting, throbbing, churning, and dashing of Waves, as it were, and, at Times, a Noise like that of Thunder or Cannon, which was constantly attended with a Clattering like that of Tiles, falling from the Tops of Houses on the Streets ; sometimes, as the Wind changed, the Smoak became thinner, discovering a very ruddy Flame, and the Jaws of the Pan, or Crater, were streak'd with Red, and several Shades of Yellow. After an Hour's Stay, the Smoak, being mov'd by the Wind, afforded short and partial Prospects of the great Hollow ; in the flat Bottom of which, Mr. Berkeley could discern two Furnaces almost contiguous ; that on the Left seeming to be about three Yards in Diameter, glow'd with

red Flame, and threw up red-hot Stones with a hideous Noise; which, as they fell back, caus'd that hideous Clattering.

*May 8th*, in the Morning, Mr. *Berkeley* went up, a second Time, to the Top of *Vesuvius*, and found a different Face of Things; the Smoak ascending upright, gave a full Prospect of the *Crater*, which, as he could judge, was about a Mile in Circumference, and 100 Yards deep; a conical Mount had been formed since his last Visit, in the Middle of the Bottom. This Mount, he could see, was formed of the Stones that were thrown up, and fallen back again into the *Crater*; in this Hill there remain'd the two Mouths, or Furnaces already mention'd, that on the left Hand was on the Top of the Hill, which it had formed round it, and raged more violently than before, throwing up, every three or four Minutes, with a dreadful Bellowing, a vast many red-hot Stones, sometimes, in Appearance, upwards of a thousand, and at least 300 Feet higher than his Head, as he stood upon the Brink; but there being little or no Wind, they fell back perpendicularly into the *Crater*, increasing the conical Hill. The other Mouth, to the Right, was lower in the Side of the same new-formed Hill; Mr. *Berkeley* could discern it to be fill'd with red-hot liquid Matter, like that in the Furnace of a Glass-house, which raged and wrought like the Waves of the Sea, causing a short abrupt Noise, like what might  
be



be imagin'd to proceed from a Sea of Quick-silver, dashing among uneven Rocks. This Substance would overflow, and run down the convex Side of the conical Hill, and appearing, at first, red-hot, it chang'd Colour, and harden'd as it cool'd, shewing the first Rudiments of an Eruption, or an Eruption in Miniature, as it were. Had the Wind blew directly in the Spectators Faces, they had been in no small Danger of being stifled by the sulphureous Smoak, or being knock'd on the Head by Lumps of broken Minerals, which were seen sometimes to fall on the Brink of the *Crater*, upon those shot from the Gulph at Bottom; but as the Wind was favourable, Mr. *Berkeley* had an Opportunity of surveying this odd Scene for above an Hour and a Half together, during which Time it was very observable, that all the Vollies of Flame, Smoak, and burning Stones, came out of the Hole to the Left, while the liquid Matter, in the other Mouth, wrought and overflow'd, as has been already describ'd.

*June* 5th, after a horrid Noise, the Mountain was seen, at *Naples*, to spew a little out of the *Crater*; the same continu'd the 6th; the 7th nothing was observ'd till within two Hours of Night, when it began a hideous Bellying, which continu'd all that Night, and the next Day till Noon, causing the Windows, and, as some affirm, the very Houses in *Naples* to shake. From that Time it belch'd out  
vast

vast Quantities of molten Matter, to the South, which streamed down the Side of the Mountain, like a Pot boiling over. This Evening, Mr. *Berkeley*, returning from a Journey thro' *Apulia*, was surpriz'd, upon passing by the North Side of the Mountain, to see a large Quantity of ruddy Smoak lie along a large Tract of Sky over the River of molten Matter, which was itself out of Sight. The 9th, *Vesuvius* rag'd less violently, and that Night a Column of Fire was seen, from *Naples*, to shoot, at Times, out of its Summit. The 10th, when it was thought all would have been over, the Mountain grew very outrageous again, roaring and groaning most dreadfully. This Noise, in its most violent Fits, was like a mix'd, confused Sound, made up of the raging of a Tempest, the Murmuring of a troubled Sea, and the Roaring of Thunder and Artillery. It was very terrible, as heard in the farther End of *Naples*, at the Distance of above 12 Miles. This mov'd Mr. *Berkeley's* Curiosity to approach the Mountain; and, for this End, he, and three or four others, got into a Boat, and were set a-shore on *Torredel Groco*, a Town situated at the Foot of *Vesuvius*, to the South-west, whence they rode four or five Miles, before they came to the burning River, where they arriv'd about Midnight. The Roaring of the *Volcano* grew exceeding loud and horrible as they approach'd. Mr. *Berkeley* observ'd a Mixture of  
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of Green, Yellow, Red and Blue, in the Cloud over the *Crater*; there was likewise a ruddy dismal Light over that Tract of Land, where the burning River flow'd; Ashes continually shower'd upon them all the Way from the Sea-coast; all which Circumstances, together with the Horror and Silence of the Night, made a Scene the most uncommon and astonishing Mr. *Berkeley* had ever seen, and which still grew more extraordinary, the nearer they came to the Stream, resembling a vast Torrent of liquid Fire, rolling from the Top down the Side of the Mountain, and, with irresistible Fury, bearing down and consuming every Thing that stood in its Way. This mighty Flood divided into two different Channels, according to the Inequalities of the Mountain; the largest Stream seem'd Half a Mile broad, at least, and five Miles long. Mr. *Berkeley* walk'd so far before his Companions, up the Mountain, along the Side of the River of Fire, that he was oblig'd to retire in great Haste, the sulphureous Steam having surprized him, and almost taken away his Breath.

During their Return, which was about three o'Clock in the Morning, they constantly heard the Murmuring and Groaning of the Mountain, which, at Times, would burst out into louder Peals, throwing up large Spouts of Fire, and burning Stones, which falling down again, resembled the Stars in Rockets. Sometimes he observ'd two, at other Times three

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distinct Columns of Flame, and sometimes one vast Column, that seem'd to fill the whole *Crater*; these burning Columns, and the fiery Flames seem'd to be shot a thousand Feet perpendicular Height above the Summit of the *Volcano*.

The 11th at Night, he observ'd it, from a Terrass in *Naples*, to throw up, incessantly, a vast Body of Fire and Stones to a surprizing Height. The 12th in the Morning it darkened the Sun with Ashes and Smoak, causing a Sort of an Eclipse. This, and the preceding Day, horrid Bellowings were heard at *Naples*, whither Part of the Ashes had also reach'd. At Night he observ'd it to throw up Flame, as on the 11th. On the 13th the Wind changing, they saw a Pillar of black Smoak shot up to a prodigious Height; at Night he observ'd the Mount cast up Fire, as before, tho' not so distinctly, because of the Smoak. The 14th, a thick black Cloud hid the Mountain, so as not to be seen at *Naples*. The 15th in the Morning, the Court and Walls of the House in which Mr. *Berkeley* lodg'd at *Naples*, were cover'd with Ashes; in the Evening a Flame appear'd on a Mountain through the Cloud. The 16th the Smoak was driven by a westerly Wind, from the Town to the opposite Side of the Mountain. The 17th the Smoak appear'd much diminish'd, fat and greasy. The 18th the whole Appearance ended, the Mountain remaining perfectly quiet, without a visible



ble Smoak or Flame. A Gentleman, whose Window look'd towards *Vesuvius*, assur'd Mr. *Berkeley*, that this Night he observ'd several Flashes of Lightning, as it were, issue out of the *Volcano*.

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*An Account of a new-raised Island,  
out of the Sea, near Tercera ;  
by Mr. FORSTER.*

**J**OHN ROBINSON, Master of a small Pink-Snow, from *Pisqua-tagua* in *New-England*, arriv'd at *Tercera*, Decemb. 10, 1720 ; at 17 Leagues Distance, bearing S. E. from the said Island, he observ'd a Fire break out of the Sea. Decemb. 18, he got under Sail, at 12 o'Clock at Night, and stood from *Angras* S. E. The next Day, at two o'Clock in the Afternoon, he made an Island all Fire and Smoak ; he continu'd his Course, till the Ashes fell all Night on Deck, like Hail or Snow. He bore from it, and the Fire and Smoak roar'd like Thunder, or great Guns ; at Break of Day he stood towards it again ; at 12 o'Clock he had a good Observation, two Leagues South from it ; he sail'd round it, and so near, that the Fire and Matter it threw out, had like to have done him Damage ; in which Consternation all betook themselves to

Prayers, being in Danger of driving a-shore ; then a small Gale sprung up at S. E. and carried them clear, to their great Joy ; the Breeze was accompanied with a small Shower of Rain, which caus'd a great Dust to fall on Deck ; with the said Breeze he stood away for *Terceira*. The Governor inform'd him, that the Fire broke out *Nov. 20, 1720*, in the Night, and that the prodigious Noise it made, caus'd an Earthquake, which shatter'd several Houses in the Town of *Angras*, and Places adjacent, Prodigious Quantities of Pumice-Stones, and half-broil'd Fish, were found floating in the Sea several Leagues round the Island, and Abundance of Sea-fowl hovering about it.

Mr. *Forster* was inform'd, by an Acquaintance, that, in his Passage from *Cadiz* to *London*, the latter End of *April 1721*, he observ'd the Sea, from *Cape Finisterre*, almost to the Chops of the Channel, cover'd with Pumice-Stones, some of which he gave him.

*An Account of an EARTHQUAKE,  
at Boston in New-England ; by  
Mr. BENJAMIN COLMAN.*

THE Earthquake came suddenly on, in the Night, *October 9th, 1727*, between 10 and 11 o' Clock, in a very still and fair Evening ;

vening; the Stars so bright and glittering, that several People had taken particular Notice of them; and one or two Persons that had been in Places subject to Earthquakes, had said, transiently, that if we had been used to them, they should expect one. This was the only general Symptom of its Approach Mr. *Colman* heard of, namely, the most serene Sky and calm Air that ever was known, not a Cloud in the Sky, nor scarce a Breath of Wind stirring. And tho' this be not universally a Symptom of Earthquakes coming on Places; yet, so far as he could inform himself, it has frequently, and for the most Part, been observ'd. It was so in the dreadful Shock in *Jamaica*, upwards of 30 Years before: And a very ingenious Friend of Mr. *Colman's* inform'd him, that after that Shock, that was follow'd with several Tremors, and lesser Concussions, he could, from Day to Day, judge of the Face of the Sky and Air, whether there would be any Tremor of the Earth. If there were any Cloud hanging over any mountainous Part of the Island, there was no Shake that Day; but if all was serene and fair, he expected one, and it seldom fail'd of happening.

Yet it was not found so in the After-Tremors, which frequently returned for some Months after this great Shock; and at Times for nine Months.

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The Town of *Newbury*, at the Mouth of *Merrimack River*, about 40 Miles North-east from *Boston*, is the Place that seems to have been the Centre of the Shock and Tremors felt. There the Earth open'd, and threw up several Loads of fine Sand and Ashes, mix'd with some small Remains of Sulphur; so that taking up some of it between the Fingers, and dropping it on a Chafing-dish of bright Coals, in a dark Place, once in three Times the blue Flame of the Sulphur would plainly arise, and yield a very small Scent. By this it seems evident, that it was a sulphureous Blast which burst open the Ground, and threw up the calcin'd bituminous Earth. The Family nearest to this Eruption (it being in that Part of the Town where the Houses lie at a Distance from each other) were in the utmost Consternation; the Shock and Noise being much more terrible upon them than upon the others: And yet, at 40 Miles Distance, and upwards, it was very dreadful and astonishing.

After the first and great Shock, five or seven small Tremors were felt, that Night and next Morning; but these, and other following Rumbings and Tremors, were louder and greater at *Newbury*, and the adjacent Places: But yet, at 40 Miles Distance were felt and heard some of the greater ones, both by Day and Night.

Mr.



Mr. Colman had the following Account from Mr. Lowel, Minister in Newbury.

As to any previous Notices of the Approach of the Earthquake, I cannot find any Thing to be depended on. The Prognostications that have been among us have all failed ; such as, an unusual Brightness of the Sky, Twinkling of the Stars, &c. I certainly know, that we have heard the Rumbings in all Weathers, cloudy, foggy, rainy, snowy, clear, cold, hot, moderate, windy, calm, &c. indifferently ; and at all Hours of the Day and Night (tho' we oftener heard these Rumbings in the Night during Winter, as I think, and since, more commonly in the Day) as also when the Wind has been at any Point of the Compass, and at all Times of Tide ; and as to the Moon, equally when she was near, or farther from her Change, or Full ; neither in any particular Weather, nor on any observable Occasion, were the Shocks greater, or Rumbings louder.

As to any Alterations in the Air, or Water, after a Shock, I could never discern any ; particularly, as to the Wind being rais'd after a Shock, when it was calm before, which some reported, but I could never perceive the least Difference.

One Thing I may add here, which is very remarkable, and may be depended on : That about the Middle of *April*, that fine Sand, which was thrown up in several Places in this Parish,

Parish, at the first great Shock, *October 29th*, had a very offensive Stench, nay, was more nauseous than a putrifying Corps; yet, in a little while after, it had no Smell at all. How long it was before it began to have this Stench, I am not certain; I know it had it not at first; and I believe it was cover'd with Snow till a little while before. There is no Smell now; there has been no Opening of the Ground, throwing up of Sand, stopping or breaking out of Springs, &c. as at first. *Newbury* (as also the adjacent Towns) is a Spot of Ground very much inhabited, and continually travell'd over; and as to the Sea, contiguous to these Parts, it is full of our Coast-ers Day and Night; but no sensible Eruptions or Evacuations (that I hear of) have been observ'd either on Land or Water.

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*An Account of an EARTHQUAKE,  
that, in 1731, infested Apulia,  
and almost all the Kingdom of  
Naples; by Dr. CYRILLUS.*

**D**R. *Cyrillus* made the following short Abstract, from the Observations sent him by *Dr. Rosetti*, from *Apulia*, and from those of others, who liv'd at *Giovenazzo* and *Foggia*.

*March*

March 9, 1730-1, O. S. at 4 in the Afternoon, there was an Earthquake almost all over the Kingdom of *Naples*, but it was felt most in *Apulia*. While it lasted, all those Appearances taken Notice of by the Antients, were here also observ'd. As, first, a Tremor; then a Pulse, according to *Aristotle*, or a Succussion, as *Possidonius*, from *Seneca*, calls it; and last of all, an Inclination, or a Nutation of the Earth, like that of a Ship, as it were. These various Nutations succeeded one another alternately for three Minutes, and a few Seconds. It was not observ'd by Dr. *Rosetti*, whether Nutations and Oscillations were made in parallel Circles of the Earth, as modern Philosophers have constantly observ'd of this Phænomenon; which is a considerable Argument for the diurnal Rotation of the Earth. At that Time the Air was overcharg'd with dense, low, and immoveable Clouds, which were afterwards dissipated by a gentle, northerly Wind. Next Day the Sun shone more languid, as if he had been cover'd with very thin Clouds, tho' there were then none in the Heavens. This Phænomenon was also observ'd in the following stronger Shock. The Fishermen near the Shore observ'd the Sea swell suddenly, and they weather'd out a Storm from *Lipante* and *Barbetta*, that is nearly, from the North, without any Wind, but not without Apprehensions of being Shipwreck'd.

*March* 10, at 8 o'Clock in the Forenoon, there happen'd a new, but a shorter, and withal, a weaker Earthquake in the same Province; but not so weak but that it was felt at *Naples*. This was preceded by a Kind of Accension, or short Coruscation about Mount *Garganus*, observ'd by the Inhabitants of *Terra di Bari*, which insensibly vanish'd into Smoak or Darkeness. In the Parts about *Foggia* a strong N. E. Wind generally preceded this second Earthquake, as also the others that happen'd afterwards, in *April*, *October*, and *November*; tho' sometimes the Air was altogether calm. The Number of Houses that fell, and of Men buried in their Ruins was considerable; and from thence they diffus'd themselves into more remote Places, the *Impetus*, or Violence, gradually remitting; so that it may be said, that the Propagation of that Earthquake was excessively diminish'd (unless the different Solidity and Interruption of the interjacent Earth caus'd any Alteration) in the duplicate Ratio of the Distances, according to the common Laws of Nature in other Kinds of Motion; which was carefully observ'd in the Oscillation of Pendulums placed at different Distances from *Foggia*. For Pendulums of a Palm in Length at *Ascoli di Satriano*, and at *Giovenazzo*, and applied to a graduated Semi-circle, and moving in the Concussions of the Earth, erred more or fewer Degrees from the Center of Oscillation, according as they were more or less distant  
from



from *Foggia*. For, the Number of these Degrees, (greater in the nigher *Ascoli*, and less in the remoter *Giovenazzo*) answer'd nearly to the duplicate Ratio of the Distance of these Places from the Center of the Earthquake. And hence it likewise happen'd, that when there was but a very slight Trembling at *Foggia*, the Pendulum mov'd slowly at *Ascoli*, but stood still at *Giovenazzo*.

In almost all the Shocks for the Year, it was constantly observ'd, that a Crashing in the Air, and a horrid Noise preceded them; *Pliny*, Lib. 2. P. 80. also observes, that sometimes terrible Sounds, Bellowings, and Shouts like human, usher'd in Earthquakes. This Crashing of the Air was diffus'd in a contrary Direction: For, whereas the Parts of the Earth were shook by a Motion from the Center to the Circumference; so, on the contrary, the Motion of the Air plainly converged from the Circumference to the Center; which Phænomenon may have yielded no small Matter of Speculation to Naturalists. The Doctor would observe, that this is different from what *Aristotle* thought was the Case with Meteors; namely, that an external Wind must contribute to an Earthquake, as, according to him, the Coast of *Arabia* was shook by the Conflict of a North and South Wind; unless, perhaps, you would say, as some have suspected, that, at least, the slight and oscillating Earthquakes, produced after strong easterly Winds, might

have been owing to the retarded diurnal Motion of the Earth, at least in that Tract where the Wind blew.

Lastly, it is worth observing in this Earthquake, that near a Country Farm of *Cartbusians*, call'd *Tré Santi*, (whose House had, by the Earthquake, been levell'd with the Ground since the first of *March*) in that Spot where the Channel of the *Fontane del Posse* is most depress'd, there broke out, in a plentiful Stream, a new Spring of muddy and hot Water. This, indeed, is no new Thing, nor was it unknown to the Antients; since we find, from their Accounts, that Waters burst out when the Body of the Earth opens, in the same Manner as Water enters thro' the Seams of a Ship; they give an Account, not only of small Streams, but Deluges of Water that drowned whole Cities; which may seem more probable with those that hold with *Thales*, according to *Seneca*, that the Earth, supported by the Waters, sometimes floats like a Ship; But these Things will seem absurd to such as know the true Structure of the terraqueous Globe. The Water that burst out in *Apulia*, began to dry up gradually, and in a Month's Time it quite disappear'd; but the dry Land, even for some Time, retain'd a sulphureous Smell. Thus *Pliny*, *Lib. 31. 14.* affirms, that Earthquakes pour out, and drink up Waters: Wherefore, it is not surprizing, that we have Accounts of Lakes, Fountains, and Rivers breaking

breaking out, where there were none before, and of others being dried up. It was universally reported, that shallow Wells did, at the Time of the first Earthquake, throw out their Waters from their wide Mouths: Yet it is not at all credible, that from the greatest Shock Water should burst out, (for this could not have happen'd without, at least, overturning and entirely destroying the Kingdom of *Naples*) but that probably new Water springing up in the Bottom of these Wells, as in other Places, and filling their Cavities, it was thrown out.

In fine, the Water, which, as has been said above, had burst out near *Tré Santi*, which produced the following Phenomena.

1. Bulk for Bulk by the Areometer, it weigh'd 82 Grains more than Rain Water, and only 15 Grains more than the Water of a brackish Fountain in that Place.

2. A Pound of the same Water distill'd to Dryness, left behind, in the Bottom of the Vessel, half a Drachm of a Substance inclining to the Nature of *Crocus Martis*, sprinkled over with a Scruple of white and insipid Earth: The Loadstone attracted some reddish Particles from this Dust after drying it. In the Distillation a sulphureous Smell was very sensible. And hence, after the Experiments of the celebrated M. *Lemery*, we have a new Accession of Arguments, that subterraneous Fires and Volcano's may be easily accended by the Com-

Commixture of Sulphur and Iron; and consequently, that Earthquakes may be produced by the successive Kindling of latent Fires.

3. In fine, 10 Drachms of the Galls, call'd *di Cevante*, and with which Ink is made, reduced to a very fine Powder, and infused in two Pounds of that Water, began to tinge it of a light azure Colour, with a subsequent Precipitation of the Powder.

*Effects of LIGHTNING; by Mr.*  
JOSEPH WASSE.

**A**T *Mixbury*, on July 3, 1725, about two in the Afternoon, one *William Hall*, about 60 Years of Age, was found dead in a hard gravelly Field, together with five Sheep, which lay round him at about 30 Yards Distance, which he is supposed to have been driving; of the five, only that, which lay nearest him, had a visible Wound through the Head. The Man lay partly upon his Side; the upper Part of his Scull was terribly fractur'd, and his right Knee out of Joint; he had a Wound in the Sole of his Foot, towards the Heel; his right Ear was cut off, and beaten into his Scull, and the Blood flowed out of that Part upon the Ground; all his Cloaths and Shirt were tore to small Pieces, and hung about him; but from  
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the Girdle downwards they were entirely carried away, and scattered up and down the Field; particularly the Soles of a strong new Pair of Shoes were rent off; his Hat was torn in Pieces; Mr. *Wasse* had a Hand-breadth of it, full of irregular Slits, and some few Places cut, as it were, with a sharp Pen-knife, and a little singed in the upper Part; his Beard and the Hair of his Head were for the most Part, close burnt off; the Iron Buckle of his Belt was thrown forty Yards off; and a Knife in the Right-side Pocket of his Breeches was broken to Pieces, not melted, and the Haft split; near each Foot appeared two round Holes, about a Yard deep, and five Inches Diameter, which shews the Force of the Blow. About the Time this Accident happened, a Tradesman of *Mixbury* observed a Fire-ball, as large as a Man's Head, to burst in four Pieces near the Church. The Storm began at about half an Hour past One of the Clock, and lasted, with Intermission, till half an Hour past Two, and we observed the Lightning towards *Aylesbury* all the Evening. Two Persons at *Aynho* were a little burnt at the same Time, and one of them struck down to the Ground; Mr. *Wasse* himself heard the Hiss of a Ball of Fire, almost as big as the Moon, that flew over his Garden S. E. to N. W.

To make a gross Estimate of the Force, Mr. *Wasse* took a Cohorn, charged with three  
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Quarters of a Pound of a very good Powder, wadded with thick Paper, and fired it against a Stone of the same Dimensions, but not so hard, which it shattered to Pieces at half an Inch's Distance. But in the above-mentioned Blow, there was above treble the Effect, without any discoverable Particles at all; and yet it seems to fly like small Shot, pierces only here and there, and leaves a great many Places quite untouched, as was evident from the Hat Mr. *Wasse* had by him. To confirm this, one *Isaac Marshal* of *Mixbury* assured him, that in the Middle of the same Storm, he received a Blow upon his Hat, which rattled like Shot through the Branches of a Tree; it beat in the Crown of the Hat a little, without perceiving it; he staggered, and was giddy for two Days afterwards. Two of his Sons were knocked down to the Ground at the same Instant, and stunn'd a little; but presently came to themselves, and had no Wound. *Query*, Whether this may not be accounted for, by supposing the Flame to rarify the Air, and make a Sort of *Vacuum* about one; into which when it returns again, it gives a Stroke, like that of a Beetle, as he express'd it. Mr. *Wasse* supposes that a Wind Gun, with compressed Air, would have the same Effect, and might easily be tried upon a Dog, or some such Animal.

F I N I S.



